

CHAPTER SIX: INDUSTRIAL

6.1 INTRODUCTION

The Industrial Conservation Program for the *Fourth Management Plan for the Pinal Active Management Area* (4MP) is the same as in the Third Management Plan (3MP), with the exception of the program for Large-Scale Power Plants. The Industrial Conservation Program/Large-Scale Power Plant program is similar to the program in the 4MP for the other four Active Management Areas (AMAs). The objective of the Industrial Conservation Program is to move industrial users within the Pinal AMA (PAMA) to the greatest level of water use efficiency economically attainable given the use of the latest available water conservation technology. The 4MP also provides incentives to encourage industrial users to replace groundwater supplies with renewable supplies. Efficient use of groundwater and the replacement of groundwater sources with renewable supplies contribute to the achievement and maintenance of the PAMA water management goal.

6.1.1 What is an Industrial water user?

An industrial user is a person who uses groundwater withdrawn pursuant to a Type 1 or Type 2 non-irrigation grandfathered right (GFR) or a withdrawal permit for an industrial use. For more information on industrial users, refer to the *Demand and Supply Assessment, Pinal Active Management Area*, (Assessment) (ADWR, 2011). These GFRs and permits (collectively referred to in this chapter as “industrial rights”) have annual volumetric groundwater allotments. The total volume of Type 2 GFRs in the PAMA was set immediately following enactment of the *1980 Groundwater Code* (Code). The total volume of water associated with Type 1 GFRs can increase over time as agricultural land with Irrigation Grandfathered Rights (IGFRs) is retired from agricultural production and the IGFRs are converted to Type 1 GFRs. However total allowable groundwater use is reduced at the time of conversion of the IGFR to a Type 1 GFR. General Industrial Use (GIU) groundwater withdrawal permits are issued by ADWR if water service cannot be secured from a municipal provider and if the use of surface water or reclaimed water, or the purchase or lease of a GFR is not economically feasible. GIU Permits expire after a specified period of years.

An industrial user may receive groundwater from an irrigation district. However, an industrial user may not receive groundwater from an irrigation district in excess of the amount it was entitled to receive on June 12, 1980 unless it has obtained a GFR or a GIU permit. (A.R.S. §§ 45-497(B) and 45-515).

There are also groundwater users that, although served by a municipal water provider, are subject to industrial program conservation requirements through the Municipal Conservation Program. These users include turf-related facilities, public rights-of-way and large-scale cooling facilities not part of a large-scale power plant. These users are referred to in the Municipal Conservation Program as “Individual Users.”

6.1.2 Industrial Conservation Programs – History and Background

The Industrial Conservation Programs for the various subsectors are based on the requirement in the Code to include a conservation program for all non-irrigation uses of groundwater. Conservation requirements are based on the use of the latest commercially available conservation technology consistent with reasonable economic return. For the 4MP the Code authorizes ADWR to include additional conservation requirements for non-irrigation uses if feasible.

All ADWR management plans have included conservation requirements for industrial users. The First Management Plan (1MP) requirements stressed water use efficiency and contained other general requirements. There were specific conservation programs only for metal mines, turf-related facilities, electric power plants, sand and gravel facilities and other industrial users. As a result of consultant studies done for the Second Management Plan (2MP), additional conservation requirements were added for dairies and cattle feedlots. In addition, there was a more specific reclaimed water incentive provision for turf-

related facilities. In the 3MP, separate industrial program categories were created for large-scale cooling facilities, new large landscape users and new large industrial user subsectors. These three industrial water use groups were included in the “all industrial users” category in the 2MP, but were separated out to more clearly present the water use characteristics and specific conservation requirements for the third management period. The 4MP includes the same programs that made up the 3MP Industrial Conservation Program. There are nine industrial program subsectors in the 4MP for the PAMA: (1) turf-related facilities, (2) sand and gravel facilities, (3) mining facilities, (4) large-scale power plants, (5) large-scale cooling facilities, (6) dairy operations, (7) cattle feedlot operations, and (8) new large landscape users, and (9) new large industrial users. There are also over-arching requirements that apply in general for all industrial users, regardless of the industrial subsector category.

6.1.2.1 All Industrial Users

The PAMA 4MP Industrial Conservation Program includes general conservation requirements that apply to all industrial users. For those Industrial Conservation Programs where a water conservation plan was required by the 3MP, an update to that plan is required within 180 days after the industrial user receives written notice from ADWR of its 4MP conservation requirements.

6.1.2.2 Turf-related Facilities

A turf-related facility is any facility, including schools, parks, cemeteries, golf courses or common areas within a housing subdivision with 10 or more acres of water-intensive landscaped area. Because “irrigation” is defined in the Code as water applied for the purpose of growing crops for sale or consumption, turf-related watering for recreational and aesthetic purposes is considered a non-irrigation water use rather than an irrigation use. Turf-related facilities apply water for growing turfgrass and other landscaping plants and for filling and maintaining water levels in bodies of water. Water application efficiency is determined by the type of water application system that is utilized, maintenance of the system, water application scheduling, site topography, soil type, weather conditions and water quality.

Turf-related facilities regulated under the Industrial Conservation Program obtain groundwater pursuant to Type 1 or Type 2 non-irrigation grandfathered rights or groundwater withdrawal permits. In addition, some turf-related facilities are served groundwater by municipal water providers and thus are also subject to the conservation requirements set forth in this section through provisions of the Municipal Conservation Program (*see Chapter 5 of this plan*). These municipally-served facilities are called individual users.

6.1.2.3 Sand and Gravel Facilities

Regulated sand and gravel facilities are facilities that use more than 100 ac-ft of water from any source in a calendar year. Sand and gravel facilities typically mine unconsolidated stream deposits to produce construction materials. The aggregate must be sorted according to grain size and washed to remove fine-grained particles. Aggregate washing accounts for the bulk of water use by sand and gravel producers. In addition to using water for washing, water is used for the following purposes: (1) to produce ready-mix concrete, bricks, blocks and asphaltic concrete; (2) to control dust; (3) to wash the outside of vehicles; (4) to wash the inside of mixer drums; (5) to wash other equipment; (6) to cool equipment; (7) to cool material; and (8) for domestic purposes.

6.1.2.4 Mining Facilities

ADWR regulates mining facilities that mine and process ores and use or have the potential to use more than 500 ac-ft of water per year.

6.1.2.5 Large-scale Power Plants

ADWR regulates power plants that produce or are designed to produce more than 25 megawatts of electricity. Two types of electric power plants are regulated in the 4MP: steam electrical plants and

combustion turbine plants. Steam electrical plants use cooling towers to dissipate excess heat that builds up in the steam electrical generation process. Combustion turbine plants do not use steam to generate electricity. Rather than using steam to drive a turbine, combustion turbines use compressed air. Steam electric power plants use more water than combustion turbine plants. Regardless of whether the plant is a steam electric power plant or a combustion turbine plant, the major consumptive use of water at electrical plants is evaporation from cooling towers. Because of the large volume of water used in towers to condense steam, conservation requirements for the electric power plants require facilities to achieve a high level of efficiency in cooling tower operation. Some large-scale power plants such as combustion turbine plants utilize cooling towers for dissipation of heat for auxiliary loads. These are regulated in this subsector, but the conservation requirements are similar to the Large-Scale Cooling Facility Program.

6.1.2.6 Large-scale Cooling Facilities

Cooling towers cool water that has absorbed the heat load of a heat-generating process. Cooling towers are present at a variety of commercial, industrial and institutional facilities. Large-scale cooling facilities are defined as facilities with an aggregate cooling capacity of a minimum of 1,000 tons. The minimum cooling unit that is added to create the aggregate total of 1,000 tons is 250 tons in size. Most large-scale cooling facilities are served by municipal water providers. These facilities are termed individual users. Water providers are responsible for the individual users' compliance with industrial conservation requirements unless they have notified ADWR of the existence of the individual user as provided in section 5-610 of the Municipal Conservation Requirements (*See Chapter 5 of this plan*), in which case the individual user is responsible for compliance. Large-scale cooling facilities served by their own wells are regulated directly by ADWR and are responsible for complying with industrial conservation requirements.

6.1.2.7 Dairies

ADWR regulates dairy operations that annually house a monthly average of 100 or more lactating cows per day. The majority of water use at dairy operations occurs for animal drinking needs, udder washing, barn cleanup, and animal cooling.

6.1.2.8 Cattle Feedlots

ADWR regulates cattle feedlot operation that house and feed an average of 100 or more beef cattle per day during a calendar year. Water is primarily used for animal drinking and dust control.

6.1.2.9 New Large Landscape Users

New large landscape users are industrial users with a substantial water-intensive landscaped area that was planted after January 1, 1990. The conservation program differentiates between two types of large landscape users: non-residential facilities that are hotels or motels, and non-residential facilities that are not hotels or motels. If the facility is not a hotel or motel, conservation requirements apply to landscapable areas in excess of 10,000 square feet. If the facility is a hotel or motel, requirements apply to landscapable areas in excess of 20,000 square feet.

If a facility has 10 or more acres of water-intensive landscaped area it is defined as a turf-related facility and is subject to specific conservation requirements discussed in Section 6.7 of this chapter.

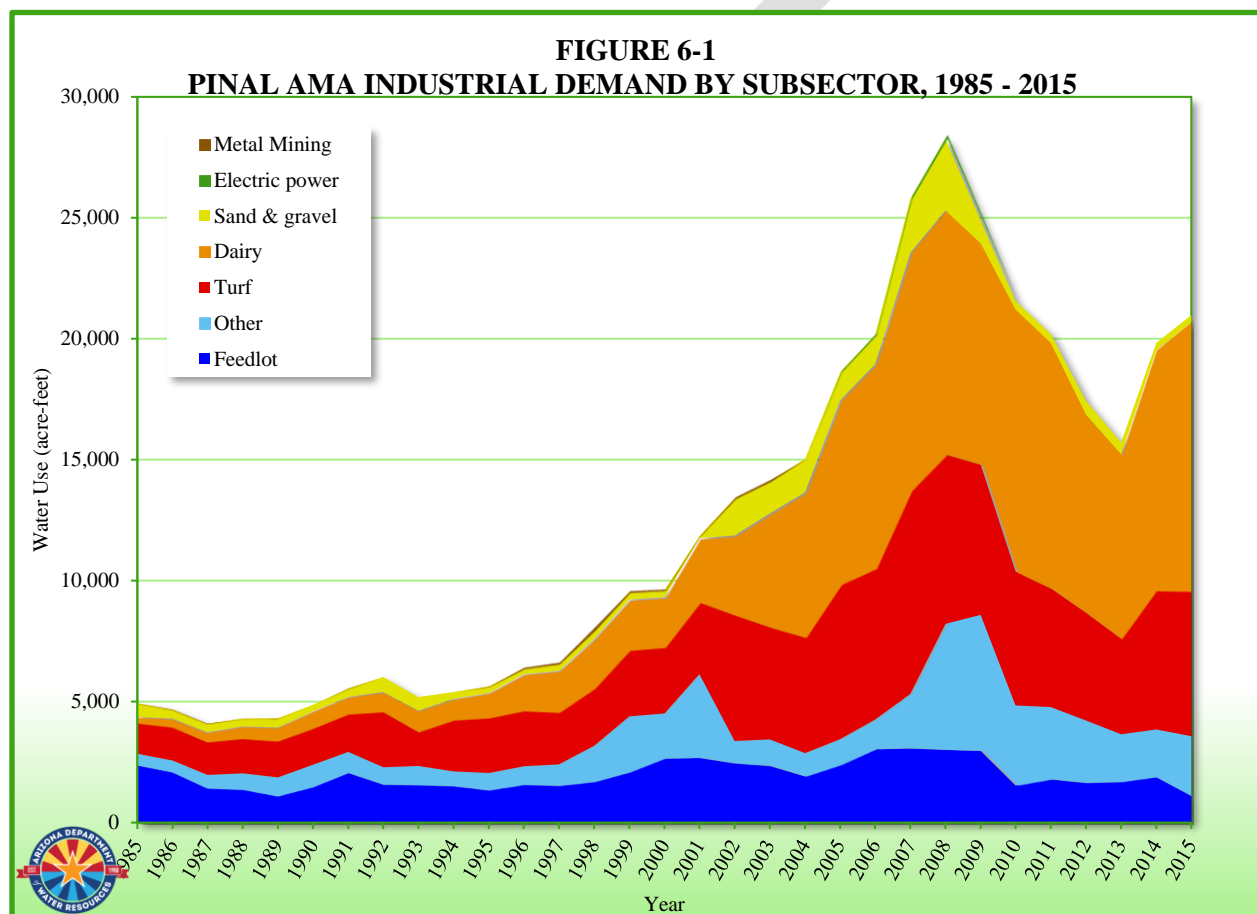
6.1.2.10 New Large Industrial Users

New large industrial users are industrial users that use over 100 ac-ft per year and commence use after January 1, 2020. In the 3MP, new large industrial users were defined as industrial users that use over 100 ac-ft of water per year and commenced use after January 1, 1990.

6.2 RELATIONSHIP OF THE INDUSTRIAL SECTOR TO ACHIEVEMENT OF THE AMA WATER MANAGEMENT GOAL

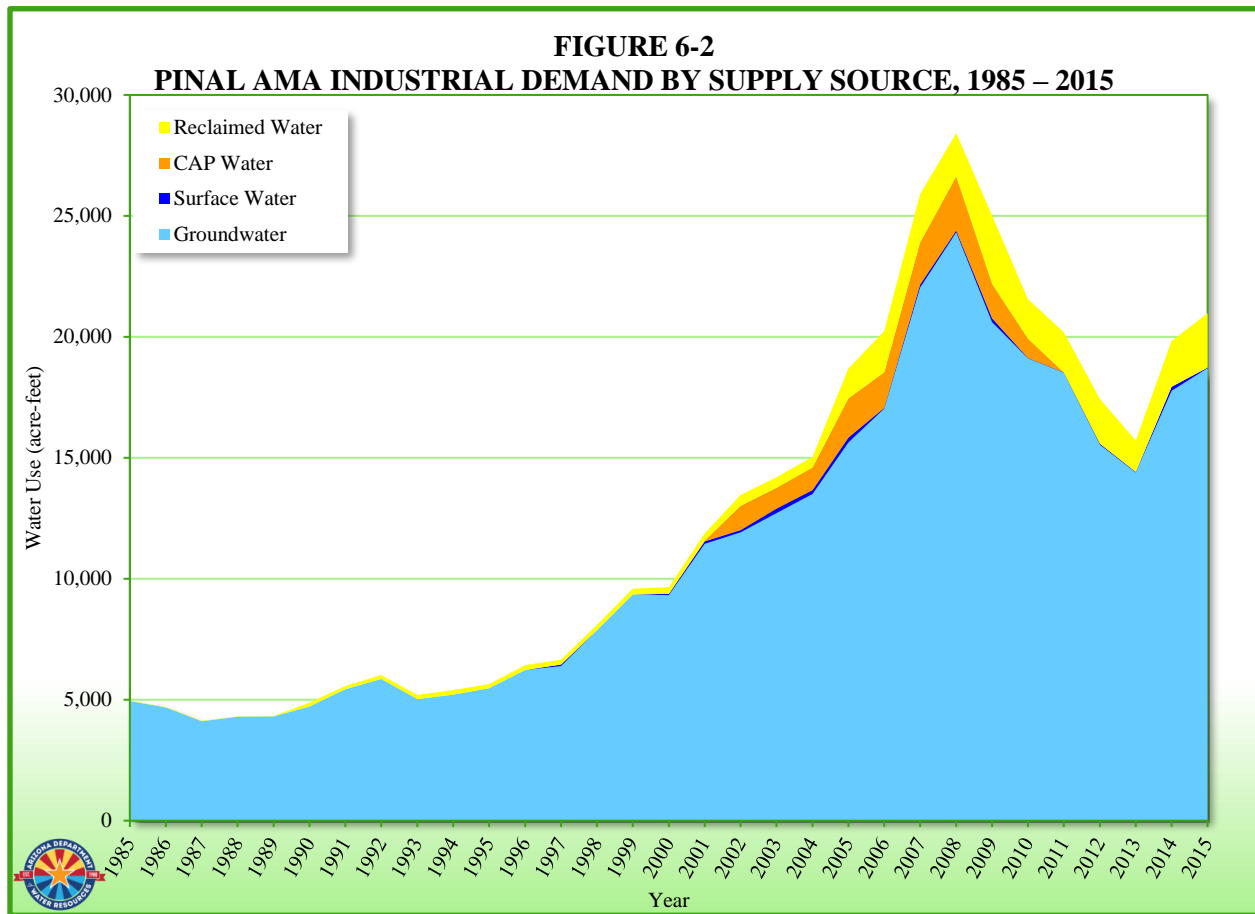
6.2.1 PAMA Industrial Sector Description

The industrial sector in the PAMA has increased over time, particularly since the year 2000. Dairy, turf-related facility, and sand and gravel use increased with the building boom (See Figure 6-1). Electric power and mining use is included in Figure 6-1, but is not easily visible due to the much larger demand in the other industrial subsectors in the PAMA. Industrial demand as a percentage of overall water use accounted for two percent of the total PAMA water demand in 2015, or about 21,000 ac-ft. About 50 percent of this demand was for dairies, 29 percent was for turf-related watering, and the remainder was for feedlots, sand and gravel operations and other industrial uses.



Groundwater remains the primary source of industrial sector supply in the PAMA, accounting for 89 percent in 2015. Reclaimed water and a very small volume of surface water made up the remaining supply in 2015 (See Figure 6-2).

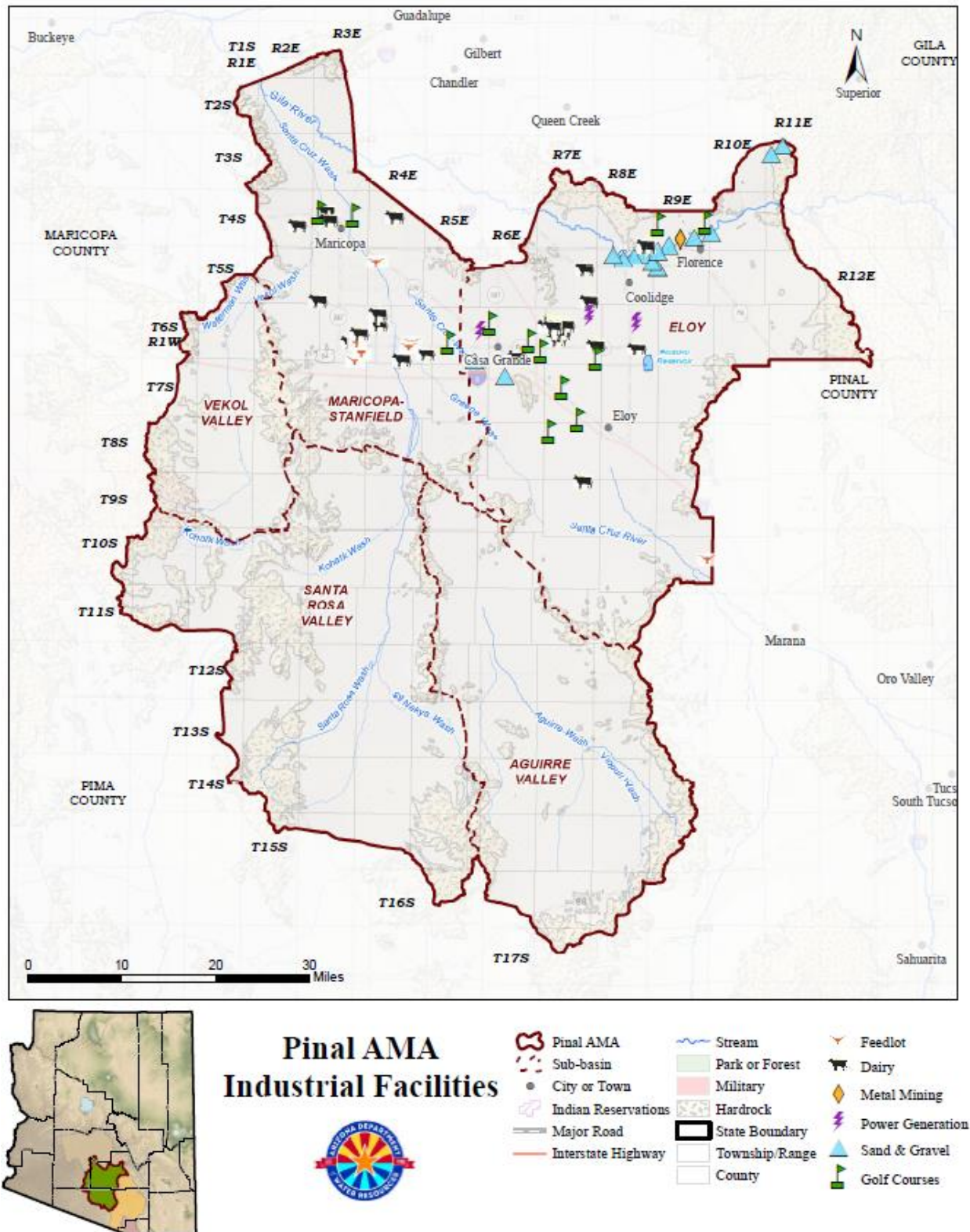
Dairies are the predominant industrial use in the PAMA. In 2015, 24 dairies reported using about 11,100 ac-ft of water, nearly all of which was groundwater. Dairies are located in the Maricopa-Stanfield and Eloy sub-basins of the PAMA, with most being located south of Casa Grande and west of Eloy. (See Figure 6-3). Turf-related facilities are the second largest industrial subsector in PAMA. Golf courses comprise the majority of the turf-related facility demand in PAMA. There are 13 golf courses in the PAMA that qualify as turf-related facilities. Sand and gravel operations are generally located within stream channels.



6.2.2 Industrial Water Use Profile

Table 6-1 shows the historical industrial demand by source from 1985 to 2015 in the PAMA. The sum of the annual water allotments for GFRs and permits is also shown in Table 6-1. Industrial allotments can increase as IGFRs are retired to Type 1 GFRs. However, total allowable groundwater use is reduced at the time of conversion of the IGFR to a Type 1 GFR. The sum of the industrial allotments may decrease due to non-irrigation rights becoming inactive, or through extinguishment of GFRs. As of 2015, the annual industrial demand was 38 percent of the total allotment of allowable industrial groundwater use under the Code. It also represents a potential for generation of AWS extinguishment credits. Under the AWS Rules, GFRs may be extinguished to generate credits that may be used to meet the consistency with goal criterion of the AWS Rules. Extinguishment of a Type 1 GFR is based on the Type 1 acres, while extinguishment of a Type 2 GFR is based on the Type 2 allotment. Extinguishment credits reduce over time based on the year 2055 minus the year the right is extinguished. Mineral extraction Type 2 GFRs and Groundwater Withdrawal Permits do not qualify for extinguishment under ADWR rules. The portion of the 2015 industrial allotment that was metal mining was 806 ac-ft. Historical water use in each of the industrial subsectors is shown in Table 6-2.

FIGURE 6-3
INDUSTRIAL FACILITIES BY SUBSECTOR IN THE PINAL AMA



Industrial demand projections in the PAMA Assessment (ADWR, 2011) ranged from about 25,200 to 44,000 ac-ft in the year 2025. In all projected scenarios in the 4MP, as in the Assessment, groundwater remains the primary water supply for the industrial sector.

TABLE 6-1
PINAL AMA INDUSTRIAL DEMAND & ALLOTMENT, 1985 - 2015

Year	Demand	Groundwater	CAP Water	Reclaimed Water	Surface Water	Industrial Allotment
1985	4,955	4,946		9		24,239
1986	4,692	4,682		10		38,653
1987	4,120	4,108		12		48,240
1988	4,312	4,300		12		38,322
1989	4,321	4,309		12		25,050
1990	4,875	4,726		149		25,505
1991	5,574	5,442		132		25,528
1992	6,023	5,865		158		27,880
1993	5,192	5,026		166		27,524
1994	5,398	5,216		182		30,089
1995	5,647	5,471		176		30,089
1996	6,434	6,234		200		31,179
1997	6,648	6,389		195	64	31,985
1998	8,098	7,866		232		32,224
1999	9,590	9,347		243		32,265
2000	9,653	9,328		280	45	36,643
2001	11,883	11,435	39	303	106	36,698
2002	13,465	11,914	1,007	453	91	41,369
2003	14,191	12,716	860	441	174	43,170
2004	15,046	13,508	937	441	160	44,434
2005	18,696	15,640	1,630	1,230	196	44,369
2006	20,243	17,042	1,462	1,715	24	48,185
2007	25,905	22,033	1,742	2,000	130	51,153
2008	28,423	24,332	2,236	1,791	64	54,822
2009	25,014	20,611	1,420	2,829	153	55,151
2010	21,565	19,114	791	1,641	20	55,915
2011	20,199	18,514		1,663	22	56,191
2012	17,434	15,543		1,846	45	56,599
2013	15,714	14,387		1,295	32	56,583
2014	19,831	17,760		1,899	172	58,300
2015	20,986	18,698		2,259	29	55,674

6.2.2.1 Turf-Related Facilities

ADWR has identified 51 turf-related facilities in the PAMA, including golf courses, schools, and homeowners associations. Lakes and parks are subject to regulation as turf-related facilities if they have 10 or more acres of water-intensive landscaping. One lake facility and six park facilities have been identified in the PAMA. During the fourth management period, ADWR will seek to identify any additional turf-related facilities in the PAMA. The location of PAMA turf-related facilities that are golf courses are shown in Figure 6-3.

Total water use by all turf-related facilities in the PAMA was 8,686 ac-ft in 2015. Seventeen of these received all or a portion of their water from municipal providers and were classified as individual users. Their water use is included in the water demand for the municipal sector. The remaining 34 turf-related facilities are industrial users that were either in existence before the Code and use Type 2 rights or were developed after the Code on retired agricultural land using Type 1 rights or have a groundwater withdrawal permit such as a GIU permit. This industrial subsector has grown significantly from using 1,280 ac-ft of water in 1985 to using 6,029 ac-ft in 2015. Total demand by industrial turf-related facilities is second only to the dairy subsector in the PAMA.

In 2015, there were 13 regulated golf courses in the PAMA; eight were industrial users; the other five were served by municipal water providers and thus categorized as individual users. Golf courses in the PAMA used about 3,874 ac-ft of water in 2015. Approximately 59 percent of this use was groundwater. Municipally supplied CAP made up 25 percent of the golf course demand, and the remaining demand was met with direct-use reclaimed water and a very small volume of surface water. Turf-related facilities that use any groundwater, regardless of whether they are industrial users or served by a municipal provider, must comply with a maximum annual water allotment based on the size and age of the facility.

6.2.2.2 Sand and Gravel Operations

Sand and gravel facilities in the PAMA used 303 ac-ft of water in 2015. Sand and gravel demand peaked in 2008 at 2,955 ac-ft. In 2015, there were 16 active sand and gravel operations in the PAMA. Increases in sand and gravel production and associated water use are closely tied to population growth and urbanization. Sand and gravel operations in the PAMA have historically relied solely on groundwater.

6.2.2.3 Mining Facilities

In 2015, the mining subsector had a combined total of 806 ac-ft of grandfathered groundwater rights and permits available, although no water was used by the mines in PAMA in 2015. The highest year of mining in the PAMA occurred in 1998 when 160 ac-ft of groundwater was used.

Copper is the primary product of mines in the PAMA. Historically, the methods that have been used to mine copper have been open pit and underground. Due to the depth and grade of ore bodies located in the PAMA, this process is no longer commercially feasible. Consequently, mining companies in the PAMA are now using an innovative process known as “in situ” or “in-place” mining. This process requires only a fraction of the water used by conventional mining techniques.

Mining has always been present in the PAMA but has not been a significant subsector and has remained relatively static for decades. There is currently one active mining facility in the PAMA. However, no water has been used by the mines in the PAMA since 2005. Historically, mining in the PAMA has relied on groundwater.

6.2.2.4 Large-scale Power Plants

As of 2016, there were two electric power plants located in the PAMA built after 1995. Both of these power plants are considered municipal users because they do not receive water from an industrial right or permit.

6.2.2.5 Dairies

Dairies have always been an important component of the PAMA industrial sector. In 1995, nine dairies used a total of 1,030 ac-ft of water. In 2015, the 24 dairies in PAMA used 11,086 ac-ft. This represents 53 percent of the PAMA’s total industrial water demand. The growth in dairy subsector water use over the last decade was due primarily to the relocation of a number of Phoenix AMA dairies to the PAMA. ADWR continues to identify new dairies in the PAMA. Historically, most dairy water use in the PAMA has been groundwater.

TABLE 6-2
PINAL AMA HISTORICAL INDUSTRIAL DEMAND BY SUBSECTOR (ac-ft)

Year	Total	Dairy	Turf	Other	Feedlot	Sand & gravel	Electric power	Mining
1985	4,955	245	1,280	478	2,370	557		25
1986	4,692	345	1,390	489	2,080	361		27
1987	4,120	395	1,371	555	1,415	350		34
1988	4,312	506	1,434	683	1,359	319		11
1989	4,321	554	1,502	781	1,091	388		5
1990	4,875	697	1,504	925	1,476	268		5
1991	5,574	711	1,564	882	2,049	342		26
1992	6,023	806	2,297	718	1,572	625		5
1993	5,192	867	1,419	789	1,555	559		3
1994	5,398	869	2,136	608	1,504	277		4
1995	5,647	1,030	2,289	712	1,334	253		29
1996	6,434	1,498	2,311	762	1,562	236		65
1997	6,648	1,700	2,161	885	1,524	286		92
1998	8,098	2,042	2,376	1,499	1,682	339		160
1999	9,590	2,079	2,754	2,307	2,082	286		82
2000	9,653	2,058	2,744	1,873	2,645	277		56
2001	11,883	2,630	2,989	3,460	2,676	86		42
2002	13,465	3,259	5,224	933	2,448	1,526		75
2003	14,191	4,679	4,652	1,104	2,342	1,326		88
2004	15,046	5,980	4,801	963	1,912	1,368		22
2005	18,696	7,584	6,420	1,075	2,385	1,145	73	14
2006	20,243	8,400	6,286	1,229	3,033	1,199	96	
2007	25,905	9,794	8,432	2,254	3,064	2,231	130	
2008	28,423	10,072	7,020	5,206	3,008	2,955	163	
2009	25,014	9,131	6,215	5,635	2,958	949	126	
2010	21,565	10,830	5,543	3,305	1,534	353		
2011	20,199	10,131	4,925	2,984	1,788	371		
2012	17,434	8,165	4,475	2,585	1,637	572		
2013	15,714	7,608	3,976	1,964	1,685	481		
2014	19,831	9,906	5,766	1,974	1,883	302		
2015	20,986	11,086	6,029	2,460	1,108	303		

6.2.2.6 Feedlots

In 1985, 2,370 ac-ft of water was used by feedlots in the PAMA. In 2015, there were 14 active feedlot facilities in the PAMA using 1,108 ac-ft of water. No new feedlots are expected to be added to the PAMA during the fourth management period.

6.2.2.7 New Large Landscape Users

No new large landscape users served by their own wells, rather than by a municipal water provider, were identified during the third management period. However, ADWR has elected to continue to include this program in the 4MP.

6.2.2.8 New Large Industrial Users

As of July 2016, there were eight new large industrial users identified in the PAMA that are not industrial users subject to specific conservation requirements discussed elsewhere in this chapter.

6.2.2.9 Other Industrial Users

Other industrial users in the PAMA used about 2,225 ac-ft of groundwater in 2015, which accounted for about 12 percent of the total industrial groundwater withdrawals in the AMA in that year. Many different types of commercial and manufacturing uses are included in this category.

In the PAMA, there are 37 water rights and permits associated with this category. The total annual groundwater allotment of rights and permits associated with this category, excluding dewatering and poor quality water permits, is nearly 7,691 ac-ft. The largest is a Type 1 owned by Volkswagen of America, Inc. for 3,021 ac-ft.

6.3 INDUSTRIAL CONSERVATION PROGRAMS DESCRIPTION

6.3.1 All Industrial Users Conservation Program Description

The conservation requirements in this section apply to all industrial water users. In addition to these requirements, certain industrial users are also required to comply with conservation requirements specific to their type of water use explained in more detail under other sections of this chapter. For example, a sand and gravel facility is required to comply with the requirement in this section to use plants from the ADWR Low Water Use/Drought Tolerant Plant List for the PAMA. (See http://www.azwater.gov/AzDWR/StatewidePlanning/Conservation2/LandscapePros/PlantLists_Landscaping.htm) for any landscaping at the facility, if applicable; and, in addition, must comply with the conservation requirements in Section 6.8 of this chapter.

The following industrial users are required to comply with the conservation requirements for all industrial users in this section, as well as conservation requirements for their specific type of water use in other sections of this chapter: turf-related facilities, sand and gravel facilities, metal mining facilities, large-scale power plants, large-scale cooling facilities, dairy operations, new large landscape users, and new large industrial users. All remaining industrial users are referred to in this section as “other industrial users” and are required to comply only with the conservation requirements for all industrial users in this section.

The PAMA 4MP conservation program for all industrial users is identical to the 3MP program. All industrial users are required to avoid waste and make diligent efforts to recycle water. Single-pass cooling or heating is not allowed unless the water is otherwise reused.

Industrial users that are not regulated as turf-related facilities or new large landscape users are required to use plants listed on the ADWR Low Water Use/Drought Tolerant Plant List for the PAMA for landscaping where feasible, and water with efficient irrigation systems. Improving irrigation efficiency can be a source of major water savings whether the plants have high or low water needs. ADWR encourages all facilities to irrigate efficiently regardless of the type of vegetation planted. In addition, since January 1, 2002, industrial users have been prohibited from serving groundwater to vegetation planted in a public right-of-way on or after January 1, 2002 unless the plants are on the ADWR Low Water Use/Drought Tolerant Plant List for the PAMA. Industrial users have also been prohibited from serving groundwater to a water feature in the right-of-way if installed after January 1, 2002.

6.3.2 Turf-related Facility Program Description

6.3.2.1 Maximum Annual Water Allotment

Base Allotment

The core of the conservation program for turf-related facilities is the maximum annual water allotment. The allotment is calculated differently for different types of facilities, but generally there is a direct relationship between the number of acres to which water is applied and the volume of the allotment. The total acreage

of turf, low water use landscaped area and water surface area is multiplied by an acre-foot per acre rate to determine the allotment.

The allotment for all turf-related facilities in the PAMA is calculated by determining the actual acreage within the facility in each of the three landscaping categories mentioned above, and then multiplying the number of acres by the appropriate application rate (*See Table 6-3*). The approach used for these facilities allows expansion of water-intensive landscaped area. Beginning in the 1MP, ADWR recognized that the latest conservation technology for golf courses includes course design which concentrates water-intensive landscaping into areas that come into play and water management practices which adjust water application schedules for weather conditions and seasons of highest play. The allotment for golf course acreage that came into existence after December 31, 1984 is therefore capped to encourage efficiency in design, construction, water application and over-seeding practices. These water allotment caps are described below.

**TABLE 6-3
PAMA ANNUAL APPLICATION RATES
FOR TURF-RELATED FACILITIES**

Type of Use	Application Rate (ac-ft per acre)
Turf	4.8
Water Surface Acres	6.2
Low Water Use Landscaping	1.5

Post-1985 golf courses will receive annual water allotments based on the same formula use for other turf-related facilities, up to a maximum of 24.5 ac-ft per hole for turf and low water use landscaped area. The management plan allows for an allotment addition for turf and low water use landscape in excess of 24.5 ac-ft per hole, if reclaimed water will eventually be used on the excess acreage. The allotment for bodies of water on new golf courses that are not entirely filled with direct use reclaimed water or reclaimed water recovered within the area of impact is not to exceed an allotment for more than 0.14 acres per hole. Although the allotment is calculated on a per acre basis, the application of allotment is at the discretion of the facility manager.

Allotments for pre-1985 golf courses are calculated based upon historic acreage of turf, water surface and low water landscaping. However, any additions to such golf courses are constrained by the same allotment as post-1985 golf courses.

Allotment Additions

Under certain circumstances, a turf-related facility is entitled to an addition to its base allotment. In some cases, the allotment addition is effective only for one year; in other cases, the allotment addition is effective for a longer period. The following are the allotment additions allowed in the 4MP:

Reduction of Water-Intensive Landscaped Area

Conservation requirements for the fourth management period continue to provide an incentive to reduce water-intensive landscaped area. The annual water allotment for existing facilities is based on the maximum area of turf and water surface developed at each facility during the first management period. If historic turfed acreage or total water surface area is reduced, the allotment does not decrease. All turf-related facilities are encouraged to minimize the water-intensive landscaping to areas consistent with the intended use and enjoyment of the facility.

Allotment Addition for Establishment of Newly Turfed Area

An allotment addition is given to turf-related facilities for the establishment of newly planted turf. The allotment addition is equal to 1.0 ac-ft of water per acre of newly turfed area, and is limited to the year in which the turf is planted. For golf courses, the allotment addition is limited to an amount calculated by multiplying the number of holes present within the newly turfed area by five ac-ft of water.

Allotment Addition for Revegetation

A revegetation allotment addition is available to facilities that want to establish low water use or other site-adapted landscaping plants that will need only temporary supplemental water application after construction of a new or renovated facility. This allotment addition of up to 1.5 ac-ft per acre for up to a maximum of three calendar years is quantified and granted on an individual basis through an application process. The quantity and duration of the allotment adjustment is determined through ADWR's evaluation of each application. This adjustment is separate from the low water use landscaping component included in the maximum annual water allotment calculation, and is not included in the allotment cap for new landscaped areas within golf courses.

Allotment Addition for Filling Bodies of Water

New turf-related facilities receive a one-time allotment addition to fill bodies of water within the facility. The allotment addition is equal to the volume used for initial filling of the body of water and is given only for the year in which the body of water is filled. Any facility may also apply for an allotment addition to refill a body of water that has been emptied for maintenance work to eliminate or reduce seepage losses. The allotment addition may be given only for the year in which the body of water is refilled.

Allotment Addition for Leaching

When high levels of total dissolved solids are present in the water supply, a turf-related facility may need an additional amount of water for leaching, or deep percolation, to prevent salts from accumulating in the root zone. If salts are allowed to accumulate in the soil, salinity may eventually reach levels toxic to turfgrass. Since most water supplies in the PAMA are of a quality that does not require an additional leaching allowance, a leaching allowance was not included in the maximum annual water allotment calculation. However, if a facility's water supply has a concentration of 1,000 milligrams per liter of total dissolved solids (approximately 1.5 millimhos per centimeter of electrical conductivity) or greater, the turf-related facility may apply to ADWR for an allotment addition for leaching.

6.3.2.2 Additional Conservation Requirements

All turf-related facilities are required to prepare and maintain a water conservation plan within 180 days after notification of the conservation requirements. The plan update must outline the water management practices and technologies the facility will utilize to maximize water use efficiency. All turf-related facilities that are not golf courses are required to design, construct, and maintain grounds in a manner that will minimize water-intensive landscaped areas consistent with reasonable use and enjoyment of the facility. Golf courses have a capped maximum annual allotment which assumes water-efficient design and management.

A turf-related facility that is a cemetery must limit the water intensive landscaped area within any portion of the cemetery that came into existence after December 31, 1985, so that no more than 75 percent of the total cemetery area within that portion of the cemetery is landscaped with plants not listed on ADWR's Low Water Use/Drought Tolerant Plant List for the PAMA. This restriction does not apply to an expansion of a cemetery onto contiguous land that was under the same ownership as the cemetery as of December 31, 1985.

6.3.2.3 Reclaimed Water Use Adjustment

Currently in the PAMA, reclaimed water is the only water supply that is expected to increase in availability throughout the fourth management period. Reclaimed water's high nutrient content makes it an excellent supply for turf-related watering, as long as the nutrient load is carefully matched to plant needs and over-application of potential groundwater pollutants is avoided. Despite the availability and suitability of reclaimed water for turf watering, reclaimed water is currently underutilized as a source of water for turf-related facilities.

To encourage the maximum use of reclaimed water on turf-related facilities in the PAMA during the fourth management period, ADWR has maintained the reclaimed water incentive that was included in the 3MP. While the maximum annual water allotment will not change, each acre-foot of reclaimed water will be counted as 0.7 of an acre-foot when compliance with the maximum annual water allotment is determined. This adjustment does not apply to reclaimed water stored in a storage facility pursuant to a water storage permit and recovered outside of the area of impact of the stored water. In addition to the reclaimed water adjustment, facilities using reclaimed water may apply to ADWR for an allotment addition to allow for leaching of salts below the root zone.

6.3.2.4 Flexibility Account

In order to compensate for fluctuating weather conditions, each turf-related facility will have a flexibility account with credit and debit limits. In wetter years or through careful management, facilities will be able to accrue a credit balance of up to 20 percent of a facility's annual allotment. When weather conditions or water management decisions cause a facility's water use to exceed its allotment in any year, accrued credits are expended. If all credits are exhausted, a facility may accrue a debit balance of up to 20 percent of the allotment. A violation will occur only when all credits have been exhausted and the debit maximum is exceeded. Prudent facility managers will take advantage of wet years and the latest conservation technologies to accumulate as many credits as allowed in order to compensate for fluctuations in water demand during hot or dry years.

6.3.2.5 Monitoring and Reporting Requirements

The PAMA 4MP includes monitoring and reporting requirements for all turf-related facilities. All turf-related facility water use will be assumed to be for landscape watering purposes unless other water uses are metered separately. For example, if water for domestic uses at a park is not metered, it will count against the facility's allotment. This provision encourages facilities to install enough meters to ensure that turf-related watering is accurately measured and reported.

6.3.3 Sand and Gravel Facility Program Description

For the 4MP ADWR has not changed the Sand and Gravel Facility Program from the program included in the 3MP. The 4MP includes requirements for recycling wash water to improve water use efficiency, which can be applied by all sand and gravel operations. In addition to recycling wash water, sand and gravel facility operators must implement two additional conservation measures, included in the sand and gravel best management practices (BMP) program. There are two general BMP categories, one related to water used for dust control, and the other related to cleanup activities. The facility operator must choose the conservation measure to be implemented in each category from a list of approved measures. The measures chosen must be the most appropriate for the facility for the fourth management period.

As in the 3MP, sand and gravel operators will be required to evaluate specific water-saving methods and submit a conservation plan to ADWR during the fourth management period. The conservation plan must be submitted to the Director within 180 days after notification of the conservation requirements. The requirement to submit a conservation plan is carried over from the 3MP.

Implementation of water conservation practices or technologies can result in reduced costs which can lead to increased profits. Sand and gravel facility operators will analyze conservation methods to identify those that will result in a positive economic return. Operators will be required to perform an economic feasibility analysis of three potential conservation practices: disposal pond surface area reduction, use of clarifiers and the use of an alternative water supply to groundwater. The following potential costs and savings must be analyzed in the economic feasibility analysis:

- Labor (including planning, construction, operation, maintenance, and management time);
- Equipment (values amortized over the projected life of the equipment);
- Land value (including value of mineral reserves);
- Water costs (including pumping costs, well maintenance, and withdrawal taxes);
- Costs for chemicals and raw materials;
- Fuel or energy costs;
- Industrial wastewater disposal costs;
- Changes in revenue caused by changing production rate, minimizing “down-time” or increasing the size of reserves; and,
- Costs associated with regulatory permitting.

6.3.4 Mining Facility Program Description

While there are currently no facilities within the PAMA engaged in open-pit mining, this mining process is still common within the state. In the event that open-pit or underground mining methods are employed during the fourth management period, the legal requirements are included within this subsection. (For more information regarding program description of the traditional mining process, refer to the Tucson AMA’s 4MP.)

Because *in situ* mining is the only mining process used within the PAMA, the 4MP requirements include the following provisions:

- Long-range conservation plan
- Minimize water use to the extent practicable
- Comply with monitoring and reporting requirements

In the fourth management period, mines will be required to evaluate water conservation practices and technologies that may be implemented at their facilities and submit these evaluations to ADWR in a long-range conservation plan.

6.3.5 Large-scale Power Plant Program Description

6.3.5.1 Steam electric power plants

The 4MP requires steam electric power plants to achieve an annual average of 15 cycles of concentration in cooling towers. The cycles of concentration requirement applies only when cooling towers are dissipating heat created during the generation of electricity. In addition to achieving 15 cycles of concentration, facilities must divert the maximum possible volume of on-site wastewater (other than blowdown water and sanitary wastewater) to the cooling process so long as this steam does not have a negative impact on the cycles of concentration or any other environmental requirement.

Facilities may be granted adjustments to their full cycles of concentration requirements in cases where, due to the quality of recirculating water, adhering to the 15 cycles of concentration standard is likely to result in equipment damage or blowdown water exceeding environmental discharge standards. Cooling towers at power plants are exempted from cycles of concentration requirements during the first 12 months in which

reclaimed water constitutes more than 50 percent of tower water supply. After this period, facilities may request an adjustment to full cycles of concentration requirements for reclaimed water-served towers based on the water quality of the reclaimed water supply.

Facilities may apply to the Director to use alternative conservation technologies in place of achieving 15 cycles of concentration if the use of the proposed alternative technologies will result in equal or greater water savings. Facilities may also request a waiver from conservation requirements on the basis that cooling tower blowdown water is completely reused. Facilities must periodically measure and annually report blowdown water volumes, make-up water volumes, and the chemical concentration of blowdown and make-up water. In addition, facilities must report the amount of electricity generated, periods when they are not generating electricity, and the volume of water used for purposes other than electric power generation.

6.3.5.2 Combustion Turbine Plants

Cooling towers associated with combustion turbine power plants with a capacity of 250 tons or more have the following requirements:

- Fully operational cooling towers with 250 tons or more of cooling capacity must achieve either 120 mg/L of silica or 1,200 mg/L of total hardness in recirculating water, whichever is reached first, before blowing down;
- If needed, a facility may apply for an alternative blowdown standard for any towers using reclaimed water. During the initial 12-month period during which 50 percent or more of the water used by a tower is reclaimed water, the tower is exempt from blowdown standards;
- If needed, a facility may apply for an alternative blowdown standard for any tower if compliance with blowdown requirements would likely result in damage to cooling towers or associated equipment or exceedance of environmental discharge standards because of the accumulation of limiting constituent other than silica or total hardness.
- Facilities must record monthly and report annually the volumes of tower make-up water and blowdown water and the concentrations of silica, total hardness, or approved alternative constituent, in both make-up water and blowdown water.

6.3.6 Large-scale Cooling Facility Program Description

The purpose of cooling tower operation is to cool water that has absorbed the heat load of a heat-generating process. Cooling towers are present at a variety of commercial, industrial, and institutional facilities. Large-scale cooling facilities are defined as facilities with an aggregate cooling capacity of a minimum of 1,000 tons. The minimum cooling unit that is added to create the aggregate total of 1,000 tons is 250 tons in size. Most large-scale cooling facilities are served by municipal water providers. These facilities are termed individual users. Water providers are responsible for the individual users' compliance with industrial conservation requirements unless they have notified ADWR of the existence of the individual user as provided in section 5-610 of the Municipal Conservation Requirements (*See Chapter 5 of this plan*) or ADWR has given the individual user notice of the conservation requirements, in which case the individual user is responsible for compliance. Large-scale cooling facilities served by their own wells are regulated directly by ADWR and are responsible for complying with industrial conservation requirements.

6.3.7 Dairy Program Description

6.3.7.1 Allotment Based Requirements

The amount of water required by a dairy depends upon the number of lactating cows and non-lactating animals housed at the dairy, the breed of cow, the dairy management practices, and the type and

effectiveness of the water use technology employed. Table 6-4 summarizes daily water needs for each dairy process, assuming use of appropriate water conservation technology and practices.

**TABLE 6-4
PINAL AMA WATER NEEDS AT A TYPICAL DAIRY**

Operation	Water Use Allocation (gallons per day)	
	Lactating Cow	Non-Lactating Animal
Drinking needs ¹	30	15
Udder washing - based on 72 minutes/day at 8 gallons/minute; 16 cows per milking (two per group). Varies with number of milkings per day. ¹	35	0
Barn cleanup and sanitizing. Varies with number of milkings per day. ¹	20	0
Animal cooling management option, site-specific	10	0
Calf barn cleanup	0	5
Milk cooling tower (if present)	5	0
Miscellaneous	5	0
Total	105	20

¹ Assumes three milkings per day.

The water needs listed are based upon two assumptions: (1) milking is done three times per day per lactating animal, and (2) cooling is done during the summer for at least a portion of the herd.

The assumptions of Table 6-4 are the basis for the annual water allotments for dairies. When calculating the total annual allotment, lactating cows are allotted 105 gallons per animal per day (GAD) while non-lactating animals are allotted 20 GAD. The allotment is calculated annually and will vary with the monthly average number of lactating cows and non-lactating animals per day present at the dairy each year.

Upon application, ADWR may approve an additional allocation of water for a dairy operation above its annual allotment if the dairy operation demonstrates that one or more of the following conditions exist:

- Milking is being done more than three times daily;
- Technologies that are designed to achieve industry health and sanitation objectives, such as the recommended pre-milking sanitation method, are being used;
- Animal cooling technologies designed to increase milk production are being used.

In consideration of weather variability, ADWR has included a three-year averaging provision in the maximum annual water allotments for the fourth management period. The water use of three consecutive years can be averaged to determine if compliance with the 4MP allotment has been achieved.

6.3.7.2 Best Management Practices Requirements

As an alternative to the annual allotment requirement, a dairy may submit an application to the Director to be regulated under the Best Management Practices Program (BMP Program). This program requires implementation of conservation and management practices to maximize efficiency in the following water use categories:

- Delivery of drinking water for dairy animals;

- Udder washing and milk parlor cleaning;
- Corral design and maintenance;
- Cleaning and sanitizing milking equipment;
- Dust control, calf housing cleaning, and feed apron flushing;
- Dairy animal cooling; and
- Dairy animal feed preparation

Implementation of all the standard BMPs listed in Appendix 6B will have a specific measurable result. While most of the standard BMPs are applicable to all dairies, the water use activities associated with some of the standard BMPs may not exist at all dairies. If a dairy cannot implement a standard BMP, the dairy may apply to implement a substitute BMP with a specific measurable result that demonstrates a water savings equivalent to the water savings associated with the standard BMP. If a substitute BMP is not possible, the dairy may apply for a waiver of the standard BMP. The Director may grant a waiver only for the following standard BMPs: (1) BMP 2.1.2 (Udder Wash System); (2) BMP 2.2.2 (Milking Parlor Floor and Wall Washing); (3) BMP 4.1.1 (Milk Cooling and Vacuum Pump); (4) all of the standard BMPs in Water Use Category No. 5 (Dust Control, Calf Housing Cleaning, and Feed Apron Flushing); (5) all of the standard BMPs in Water Use Category No. 6 (Dairy Animal Cooling); and (6) all of the standard BMPs in Water Use Category No. 7 (Dairy Animal Feed Preparation).

Five years after a dairy is accepted for regulation under the BMP Program, the Director will review the dairy's BMPs to determine if they are still appropriate. If the BMPs are no longer appropriate due to an expansion of the dairy or a change in management practices, the Director will require a modification to the BMPs.

6.3.8 Cattle Feedlot Program Description

For the 4MP ADWR has not changed the Cattle Feedlot Conservation Program from the program included in the 3MP. The conservation requirements for cattle feedlot operations in the 4MP include a maximum annual water allotment for each facility based on the assumed use of specific conservation technologies.

The formula to determine a feedlot's water allotment is based on the number of gallons of water reasonably required per animal per day. To determine this amount, three components of cattle feedlot water use are considered: (1) cattle drinking water requirements, (2) dust control watering requirements, and (3) other uses. The amount of water required for each component varies with the number of cattle processed by the feedlot. Cattle drinking water requirements include water intake, water spilled while drinking, and evaporation losses from watering tanks. Drinking water requirements are estimated to be 15 GAD. Dust control watering requires approximately 10 GAD. Other uses, including water used for feed mixing, health and environmental controls, system losses, and fire protection total five GAD. Total water requirements for a cattle feedlot operation are 30 GAD. These requirements are continued for the fourth management period.

6.3.9 New Large Landscape User Program Description

In addition to the requirements that apply to all industrial users, new large landscape users must limit the percentage of water-intensive landscaped area above a specified square footage. The facility must limit its water intensive landscaped area to the greater of the following: 1) 10,000 square feet (20,000 square feet for hotels and motels) plus twenty percent of the area in excess of 10,000 square feet (20,000 square feet for hotels and motels); and 2) the total surface area of all bodies of water within the facility that qualify as water intensive landscaped area and that are allowed under the Lakes Bill, A.R.S. § 45-131, *et seq.*

Water-intensive landscaping includes not only high water using plants such as turf but also bodies of water such as ponds. However, it does not include any area of land watered exclusively with direct use reclaimed water or reclaimed water recovered within the area of impact, bodies of water used primarily for swimming,

bodies of water filled and refilled exclusively with direct use reclaimed water or reclaimed water recovered within the area of impact and bodies of water allowed under an interim water use permit pursuant to the Lakes Bill (A.R.S. §§ 45-131-139) if the body of water will be filled and refilled exclusively with direct use reclaimed water or reclaimed water recovered within the area of impact after the permit expires. If 100 percent wastewater is used to water the landscape, the requirements do not apply. For example, if there is sufficient cooling tower blowdown water and grey water available from the operations of a hotel, this wastewater could be used to water any amount of water-intensive landscaped area up to 10 acres. Once a water-intensive landscaped area equals or exceeds 10 acres in size, it is defined as a turf-related facility and is subject to regulation under that program

6.3.10 New Large Industrial User Program Description

In addition to the requirements that apply to all industrial users, new large industrial users must prepare and submit a water conservation plan to the Director. However, if the user is required to submit a conservation plan under another section of this chapter, it can combine and submit one plan.

The water conservation plan must show how much water conservation can be achieved at the facility. It must identify how water is used at the facility and what can be done to conserve it in major water use areas. The plan must also detail an employee water conservation education program at the facility and describe when conservation measures will be implemented.

6.4 INCENTIVES FOR THE USE OF RENEWABLE SUPPLIES AND REMEDIAL GROUNDWATER

The PAMA 4MP contains incentives to increase the use of non-groundwater supplies. For example, ADWR has included a reclaimed water adjustment for turf-related facilities in the management plans. When determining a turf-related facility's compliance with its maximum annual water allotment within the PAMA, ADWR will count each acre-foot of direct use reclaimed water or reclaimed water recovered within the area of impact of storage that is used by the facility as 0.7 acre-foot of water. This adjustment does not apply to reclaimed water recovered outside the area of impact of the stored water. In addition to the reclaimed water adjustment, facilities using reclaimed water may apply to ADWR for an allotment addition to allow for leaching of salts below the root zone.

Legislation was enacted in 1997 (and amended in 1999) that significantly revised the Water Quality Assurance Revolving Fund (WQARF) Program to provide incentives for the use of remediated groundwater to facilitate the treatment of contaminated groundwater. This legislation provides that ADWR shall account for most uses of groundwater withdrawn pursuant to an approved remedial action project as surface water when determining compliance with management plan conservation requirements (1999 Ariz. Sess. Law, H.B. 2189, § 51(B)). The criteria that must be met to qualify for this accounting are set forth in the legally enforceable provisions in Section 6-1604 of this chapter, entitled: *Remedial Groundwater Accounting for Conservation Requirements*. Groundwater withdrawn pursuant to an approved remedial action project retains its legal character as groundwater for all other purposes under Title 45, Arizona Revised Statutes Chapter 2. More information on ADWR's involvement in the WQARF Program is provided in Chapter 7.

6.5 NON-REGULATORY EFFORTS

ADWR has a program for water management assistance in the PAMA. Funding for the program comes from a portion of the annual withdrawal fees levied and collected from most persons withdrawing groundwater from non-exempt wells in the PAMA. Since the Water Management Assistance Program (WMAAP) began, the PAMA has funded several projects that promote prudent water management within the PAMA (*See Chapter 9 of this plan*).

6.6 INDUSTRIAL CONSERVATION REQUIREMENTS AND MONITORING AND REPORTING REQUIREMENTS FOR ALL INDUSTRIAL USERS

6-601. Definitions

In addition to the definitions set forth in Chapters 1 and 2 of Title 45 of the Arizona Revised Statutes, unless the context otherwise requires, the following words and phrases used in this chapter shall have the following meanings:

1. *“1MP” means First Management Plan for the PAMA.*
2. *“2MP” means Second Management Plan for the PAMA.*
3. *“3MP” means Third Management Plan for the PAMA.*
4. *“4MP” means Fourth Management Plan for the PAMA.*
5. *“5MP” means Fifth Management Plan for the PAMA.*
6. *“ADWR’s Low Water Use/Drought Tolerant Plant List for the PAMA” means the list of low water use/drought tolerant plants found on ADWR’s website, <http://www.azwater.gov/AzDWR/WaterManagement/AMAs/LowWaterUsePlantList.htm> including any modifications to the list.*
7. *“Industrial process purposes” means water that is used by an industrial user directly in the creation or manufacture of a product.*
8. *“Industrial use” means a non-irrigation use of water not supplied by a city, town, or private water company, including animal industry use and expanded animal industry use.*
9. *“Industrial user” means a person who uses water for industrial uses.*
10. *“PAMA” means the Pinal Active Management Area.*
11. *“Reclaimed water” has the same definition as effluent in A.R.S. § 45-101.*
12. *“Remedial Groundwater” means groundwater withdrawn pursuant to an approved remedial action project, but does not include groundwater withdrawn to provide an alternative water supply pursuant to A.R.S. § 49-282.03.*
13. *“Single-pass cooling and heating” means the use of water without recirculation to increase or decrease the temperature of equipment, a stored liquid, or a confined air space.*
14. *“Wastewater” means water that is discharged after an industrial or municipal use, excluding reclaimed water.*

6-602. Conservation Requirements

Beginning on January 1, 2020 or upon commencement of water use, whichever is later, and continuing thereafter until the first compliance date for any substitute conservation

requirement in the 5MP, an industrial user who uses groundwater shall comply with the following requirements:

- 1. Avoid waste; use only the amount of water from any source, including reclaimed water, reasonably required for each industrial use; and make diligent efforts to recycle water.*
- 2. Do not use water for non-residential single-pass cooling or heating purposes unless the water is reused for other purposes.*
- 3. Use low-flow plumbing fixtures as required by Title 45, Chapter 1, Article 12, Arizona Revised Statutes, or any applicable county or city code, whichever is more restrictive.*
- 4. Use plants listed in the ADWR Low Water Use/Drought Tolerant Plant List for the PAMA for landscaping to the maximum extent feasible, and water with a water-efficient irrigation system. An industrial user regulated as a turf-related facility under sections 6-1701, et seq., or as a new large landscape user under section 6-2401, et seq., is exempt from this requirement.*
- 5. Do not serve or use groundwater for the purpose of watering landscaping plants planted on or after January 1, 2002 within any publicly owned right-of-way of a highway, street, road, sidewalk, curb, or shoulder which is used for travel in any ordinary mode, including pedestrian travel, unless the plants are listed in ADWR's Low Water Use/Drought Tolerant Plant List for the PAMA. The Director may waive this requirement upon request from the industrial user if the industrial user demonstrates to the satisfaction of the Director that plants listed in ADWR's Low Water Use/Drought Tolerant Plant List for the PAMA cannot grow in the publicly owned right-of-way because of high elevation or low light conditions, such as a freeway underpass. This requirement does not apply to any portion of a residential lot that extends into a publicly owned right-of-way.*
- 6. Do not serve or use groundwater for the purpose of maintaining water features, including fountains, waterfalls, ponds, water courses, and other artificial water structures, installed after January 1, 2002 within any publicly owned right-of-way of a highway, street, road, sidewalk, curb, or shoulder which is used for travel in any ordinary mode, including pedestrian travel. This requirement does not apply to any portion of a residential lot that extends into a publicly owned right-of-way.*

6-603. Monitoring and Reporting Requirements

A. Requirements

For calendar year 2020 or the calendar year in which the facility first begins to use water, whichever is later, and for each calendar year thereafter until the first compliance date for any substitute monitoring and reporting requirement in the 5MP, an industrial user who uses groundwater shall, except as provided for in subsection B below, include the following information in its annual report required by A.R.S. § 45-632:

- 1. The total quantity of water by source, including reclaimed water, withdrawn, diverted, or received during the reporting year for industrial process purposes, as measured with a measuring device in accordance with ADWR's measuring device rules, A.A.C. R12-15-901, et seq.*

2. *The total quantity of water by source, including reclaimed water, withdrawn, diverted, or received during the reporting year for purposes other than industrial process purposes, as measured with a measuring device in accordance with ADWR's measuring device rules, A.A.C. R12-15-901, et seq.*
3. *An estimate of the quantity of wastewater generated during the reporting year.*
4. *An estimate of the quantity of wastewater recycled during the reporting year.*
5. *A description of the primary purposes for which water from any source, including reclaimed water, is used.*
6. *The number of acres of land that were planted with plants listed in ADWR's Low Water Use/Drought Tolerant Plant List for the PAMA during the calendar year as a result of removal of plants not on ADWR's Low Water Use/Drought Tolerant Plant List for the PAMA. An industrial user regulated as a turf-related facility under sections 6-1701, et seq., or as a new large landscape user under section 6-2401, et seq., is exempt from this requirement.*

B. Exemption

An industrial user who holds a Type 1 or Type 2 non-irrigation grandfathered right or a groundwater withdrawal permit in the amount of 10 or fewer ac-ft per year is exempt from the requirements set forth in subsection A of this section, unless the industrial user holds more than one such right or permit in the aggregate amount of more than 10 ac-ft per year and withdraws more than 10 ac-ft of groundwater during the calendar year pursuant to those rights or permits.

6-604. Remedial Groundwater Accounting for Conservation Requirements

A. Accounting

Remedial groundwater used by a person subject to a conservation requirement established under this chapter shall be accounted for consistent with the accounting for surface water for purposes of determining the person's compliance with the conservation requirement, subject to the provisions of subsections B through D of this section.

B. Amount of Groundwater Eligible for Accounting

For each approved remedial action project, the annual amount of groundwater that is eligible for the remedial groundwater accounting provided in subsection A of this section is the project's annual authorized volume. The annual authorized volume for a remedial action project approved on or after June 15, 1999 is the maximum annual volume of groundwater that may be withdrawn pursuant to the project, as specified in a consent decree or other document approved by the United States Environmental Protection Agency (EPA) or the Arizona Department of Environmental Quality (ADEQ). The annual authorized volume for a project approved prior to June 15, 1999 is the highest annual use of groundwater withdrawn pursuant to the project prior to January 1, 1999, except that if a consent decree or other document approved by the EPA or ADEQ specifies the maximum annual volume of groundwater that may be withdrawn pursuant to the project, the project's annual authorized volume is the maximum

annual volume of groundwater specified in that document. The Director may modify the annual authorized volume for a remedial action project as follows:

- 1. For an approved remedial action project associated with a treatment plant that was in operation prior to June 15, 1999, a person may request an increase in the annual authorized volume at the same time the notice is submitted pursuant to subsection C of this section. The Director shall increase the annual authorized volume up to the maximum treatment capacity of the treatment plant if adequate documentation is submitted to the Director demonstrating that an increase is necessary to further the purpose of the remedial action project and the increase is not in violation of the consent decree or other document approved by the EPA or ADEQ.*
- 2. A person may request an increase in the annual authorized volume of an approved remedial action project at any time if it is necessary to withdraw groundwater in excess of the annual authorized volume to further the purpose of the project. The Director shall increase the annual authorized volume up to the maximum volume needed to further the purpose of the project if adequate documentation justifying the increase is submitted to the Director and the increase is not in violation of the consent decree or other document approved by the EPA or ADEQ.*
- 3. The Director shall modify the annual authorized volume of an approved remedial action project to conform to any change in the consent decree or other document approved by the EPA or ADEQ if the person desiring the modification gives the Director written notice of the change within thirty days after the change. The notice shall include a copy of the legally binding agreement changing the consent decree or other document approved by the EPA or ADEQ.*

C. Notification

To qualify for the remedial groundwater accounting provided in subsection A of this section, the person desiring the accounting must notify the Director in writing of the anticipated withdrawal of Remedial Groundwater pursuant to an approved remedial action project under CERCLA or Title 49, Arizona Revised Statutes, prior to the withdrawal. At the time the notice is given, the person desiring the accounting must be using Remedial Groundwater pursuant to the approved remedial action project or must have agreed to do so through a consent decree or other document approved by the EPA or ADEQ. The notice required by this subsection shall include all of the following:

- 1. A copy of a document approved by ADEQ or the EPA, such as the Remedial Action Plan (RAP), Record of Decision (ROD) or consent decree, authorizing the remediated groundwater project. Unless expressly specified in the document, the person shall include in the notice the volume of Remedial Groundwater that will be pumped annually pursuant to the project, the time period to which the document applies, and the annual authorized volume of Remedial Groundwater that may be withdrawn pursuant to the project.*
- 2. The purpose for which the Remedial Groundwater will be used.*
- 3. The name and telephone number of a contact person.*
- 4. Any other information required by the Director.*

D. Monitoring and Reporting Requirements

To qualify for the remedial groundwater accounting for conservation requirements as provided in subsection A of this section, Remedial Groundwater withdrawn pursuant to the approved remedial action project must be metered separately from groundwater withdrawn in association with another groundwater withdrawal authority for the same or other end use. A person desiring the remedial groundwater accounting for conservation requirements shall indicate in its annual report under A.R.S. § 45-632 the volume of groundwater withdrawn and used during the previous calendar year that qualifies for the accounting.

6.7 INDUSTRIAL CONSERVATION REQUIREMENTS AND MONITORING AND REPORTING REQUIREMENTS FOR TURF-RELATED FACILITIES**6-701. Definitions**

In addition to the definitions set forth in Chapters 1 and 2 of Title 45 of the Arizona Revised Statutes, and section 6-601 of this chapter, unless the context otherwise requires, the following words and phrases used in sections 6-701 through 6-705 shall have the following meanings:

- 1. "Body of water" means a constructed body of water or interconnected bodies of water, including a lake, pond, lagoon, or swimming pool, that has a surface area greater than 12,320 square feet when full and that is filled or refilled primarily for landscape, scenic, recreational purposes, or regulatory storage.*
- 2. "Common area" means an area or areas owned and operated as a single integrated facility and used for recreational or open space purposes. A common area is maintained for the benefit of the residents of a housing development.*
- 3. "Contiguous" means in contact at any point along a boundary, or part of the same master planned community. Two parcels of land are contiguous if they are separated by one or more of the following: a road, easement, or right-of-way.*
- 4. "Direct use reclaimed water" means reclaimed water transported directly from a facility regulated pursuant to Title 49, Chapter 2, Arizona Revised Statutes, to an end user. Direct use reclaimed water does not include reclaimed water that has been stored pursuant to Title 45, Chapter 3.1, Arizona Revised Statutes.*
- 5. "Golf course" means a turf-related facility used for playing golf with a minimum of nine holes and including any practice areas.*
- 6. "Hole" means a component of a golf course consisting of a tee and a green. A practice area or driving range is not a hole.*
- 7. "Landscape watering" means the application of water from any source, including reclaimed water, to a water-intensive landscaped area, a low water use landscaped area, or revegetation acres within a turf-related facility.*
- 8. "Low water use landscaped area" means an area of land of at least one acre in aggregate, which is an integral part of a turf-related facility, watered by a permanent water*

application system and planted primarily with plants listed in ADWR's Low Water Use/Drought Tolerant Plant List for the PAMA. Mature vegetation planted in a low water use landscaped area must cover at least 50 percent of the area.

9. *"Newly turfed area" means, for a calendar year, an area of land planted with a warm-season grass species that was not planted with any warm-season grass species during the preceding calendar year.*
10. *"Overseeded area" means, for a calendar year, an area of land planted with any cool-season grass species that grows over a dormant warm-season grass species during the fall-winter period.*
11. *"Post-1985 turf-related facility" means a turf-related facility that was neither in operation as of December 31, 1985 nor substantially commenced as of December 31, 1985.*
12. *"Pre-1986 turf-related facility" means a turf-related facility that was either in operation as of December 31, 1985 or substantially commenced as of December 31, 1985, and includes any expanded or modified portion of such a facility.*
13. *"Reclaimed water recovered within the area of impact" means reclaimed water that has been stored pursuant to Title 45, Chapter 3.1, Arizona Revised Statutes, and recovered within the stored reclaimed water's area of impact. For purposes of this definition, "area of impact" has the same meaning as prescribed by A.R.S. § 45-802.01.*
14. *"Regulation golf course" means a golf course of at least 18 holes that is 6,200 yards or more in length per 18 holes as measured from back of the tee ground furthest from the green down the center line of the hole to the center of the green.*
15. *"Revegetation acres" means acreage within and/or contiguous to a turf-related facility that has been approved by the Director as qualifying for a revegetation allotment addition.*
16. *"Substantially commenced" means that all pre-construction permits and approvals required by federal, state, or local governments have been obtained or substantial capital investment has been made in the physical on-site construction.*
17. *"Total cemetery area" means an area of land being used for cemetery-related purposes, including any area of land covered by grave markers or by cemetery-related buildings, walks, pathways, and landscaping, but not including roads, parking lots, and any areas of land being held for future expansion of the cemetery.*
18. *"Turf acres" means an area of land that is watered with a permanent water application system and planted primarily with plants not listed in ADWR's Low Water Use/Drought Tolerant Plant List for the PAMA.*
19. *"Turf-related facility" means any facility, including cemeteries, golf courses, parks, schools, or common areas within housing developments, with a water-intensive landscaped area of 10 or more acres. Turf-related facilities include, but are not limited to, those facilities listed in Appendix 6A.*

20. *"Water-intensive landscaped area" means, for a calendar year, the turf acres and the water surface acres within a turf-related facility.*
21. *"Water surface acres" means the total surface area of all bodies of water that are an integral part of the water-intensive landscaped area of a turf-related facility. Bodies of water used primarily for swimming purposes are not an integral part of the water-intensive landscaped area of a turf-related facility.*

6-702. Conservation Requirements for Turf-Related Facilities

A. Maximum Annual Water Allotment

Beginning with calendar year 2020 or the calendar year in which landscape watering commences, whichever is later, and for each calendar year thereafter until the first compliance date for any substitute conservation requirement in the 5MP, an industrial user who uses water at a turf-related facility during the calendar year shall not withdraw, divert, or receive water for landscape watering purposes at the facility during a calendar year in an amount which exceeds the turf-related facility's maximum annual water allotment for the year as calculated in section 6-703.

B. Conservation Plan

No later than 180 days after receiving official notice of conservation requirements, an industrial user who uses water at a post-1985 turf-related facility shall have prepared a conservation plan for the facility that contains an accurate and detailed description of the conservation technologies, including management practices, that are applied at the facility when water is used for landscape watering purposes. The industrial user shall maintain the plan until the first compliance date for any substitute requirement in the 5MP.

C. Limiting Water-Intensive Landscaped Area

1. *Beginning on January 1, 2020, or upon commencement of landscape watering, whichever occurs later, and continuing until the first compliance date for any substitute requirement in the 5MP, an industrial user who uses water at a turf-related facility that is not a cemetery or a golf course shall design, construct, and maintain the grounds of the facility in a manner that minimizes the water-intensive landscaped area of the facility consistent with the use of the facility. All of the facility's water-intensive landscaping shall be planted in those areas directly associated with the turf-related facility's primary purpose.*
2. *Beginning on January 1, 2020 or upon commencement of landscape watering, whichever occurs later, and continuing until the first compliance date for any substitute conservation requirement in the 5MP, an industrial user who uses water at a turf-related facility that is a cemetery shall limit the water-intensive landscaped area within any portion of the facility that was neither in operation as of December 31, 1985 nor substantially commenced as of December 31, 1985 so that no more than 75 percent of the total cemetery area within that portion of the cemetery is planted with plants not listed in ADWR's Low Water Use/Drought Tolerant Plant List for the PAMA. This requirement shall not apply to any expanded portion of a cemetery in operation as of December 31, 1985 or substantially commenced as of December 31, 1985 if the expanded portion of the cemetery was under the same ownership as the cemetery as of December 31, 1985.*

6-703. Calculation of Maximum Annual Water Allotment for Turf-Related Facilities**A. Turf-Related Facilities that are Not Golf Courses**

For each calendar year, the maximum annual water allotment for a turf-related facility that is not a golf course shall be calculated by determining the number of acres in existence within the facility during the calendar year in each of the categories listed in Table 6-5 and then multiplying the number of acres in each category by the applicable application rate for each category as set forth in Table 6-5. The sum of the products, plus any allotment additions allowed pursuant to subsection D of this section, is the facility's maximum annual water allotment for the calendar year.

B. Pre-1986 Turf-Related Facilities that are Golf Courses

For each calendar year, the maximum annual water allotment for a pre-1986 turf-related facility that is a golf course shall be calculated by determining the number of acres in existence within the facility during the calendar year in each of the categories listed in Table 6-5 and then multiplying the number of acres in each category by the applicable application rate for each category as set forth in Table 6-5. The sum of the products, plus any allotment adjustments allowed pursuant to subsection D of this section, is the facility's maximum annual water allotment for the year, subject to the following limitations:

- 1. In determining the number of water surface acres in existence within the facility during the calendar year, the total surface area of any bodies of water added to the facility after December 31, 1985 and not filled and refilled exclusively with direct use reclaimed water or reclaimed water recovered within the area of impact shall be limited to an area calculated by multiplying the number of holes added to the facility after December 31, 1985 by 0.14 acre per hole. For purposes of this paragraph, a body of water filled and refilled pursuant to an interim water use permit issued under A.R.S. § 45-133 shall be deemed to be filled and refilled exclusively with direct use reclaimed water or reclaimed water recovered within the area of impact if the body of water will be filled and refilled exclusively with one of those types of reclaimed water after the permit expires.*
- 2. The total allotment for any turf acres and low water use landscaped area added to the facility after December 31, 1985 shall not exceed an amount calculated by multiplying the number of holes added to the facility after December 31, 1985 by 24.0 ac-ft of water per hole, plus any allotment additions allowed under subsection D of this section.*

C. Post-1985 Turf-Related Facilities that are Golf Courses

The maximum annual water allotment for a post-1985 turf-related facility that is a golf course shall be calculated by determining the number of acres in existence within the facility during the calendar year in each of the categories listed in Table 6-5 and then multiplying the number of acres in each category by the applicable application rate for each category as set forth in Table 6-5. The sum of the products, plus any adjustments allowed pursuant to subsection D of this section, is the facility's maximum annual water allotment for the calendar year, subject to the following limitations:

1. *In determining the number of water surface acres in existence within the facility during the year, the total surface area of all bodies of water not filled and refilled exclusively with direct use reclaimed water or reclaimed water recovered within the area of impact shall be limited to an area calculated by multiplying the number of holes present within the facility during the year by 0.14 acre per hole. For purposes of this paragraph, a body of water filled and refilled pursuant to an interim water use permit issued under A.R.S. § 45-133 shall be deemed to be filled and refilled exclusively with direct use reclaimed water or reclaimed water recovered within the area of impact if the body of water will be filled and refilled with such water after the permit expires.*
2. *The total allotment for turf acres and low water use landscaped area within the facility during the year shall not exceed an amount calculated by multiplying the number of holes present within the facility during the year by 24.0 ac-ft of water per hole, plus any allotment additions allowed under subsection D of this section.*

TABLE 6-5
APPLICATION RATES FOR TURF-RELATED FACILITIES
PINAL ACTIVE MANAGEMENT AREA

*From January 1, 2020 until the first compliance date for any substitute requirement in the 5MP
 (Ac-ft per acre per calendar year)*

Application Rate - Turf Acres Including Newly Turfed Area

	<u>2002 - 5MP</u>
<i>All Facilities</i>	4.8

Application Rate - Total Water Surface Area

	<u>2002 - 5MP</u>
<i>All Facilities</i>	6.2

Application Rate - Low Water Use Landscaped Area

	<u>2002 - 5MP</u>
<i>All Facilities</i>	1.5

D. Allotment Additions

1. Newly Turfed Area Establishment Addition

For any year in which a warm-season turfgrass species is initially planted at a turf-related facility, the facility shall receive an allotment addition of 1.0 acre-foot of water per acre of newly turfed area. For golf courses, the newly turfed area establishment addition shall not exceed an amount calculated by multiplying the number of holes present within the newly turfed area by 5 ac-ft of water.

2. Revegetation Addition

The owner or operator of a turf-related facility may apply to the Director for an allotment addition to revegetate areas within or around the facility after initial construction or renovation of new acres. The Director may allow up to an additional 1.5 ac-ft of water per

acre for up to three years if the following conditions apply to the acres for which the revegetation addition is sought:

- a. The plants that are planted within the revegetation area are listed in ADWR's Low Water Use/Drought Tolerant Plant List for the PAMA or were adapted to the site conditions prior to construction;*
- b. The aggregate area to be watered exceeds one acre and has at least 50 percent vegetative cover at maturity;*
- c. An allotment is not provided for the revegetation area under subsection A, B, or C of this section; and*
- d. All of the water applied to the revegetation acres is measured and reported as part of the total water use of the facility.*

3. Body of Water Fill and Refill Addition

- a. A turf-related facility shall receive a one-time body of water fill allotment addition equal to the volume of water used for the initial filling of any new body of water added after January 1, 2002 within the facility. The facility shall receive the allotment addition only for the calendar year in which the body of water is filled.*
- b. If a body of water at a turf-related facility is drained or partially drained to allow for repairs to reduce water losses, the owner or operator of the facility may apply to the Director for an addition to the facility's maximum annual water allotment in the amount of water necessary to refill the body of water. The Director shall grant the allotment addition if the Director determines that drainage of the body of water was necessary to allow for repairs to reduce water losses. The facility shall receive the allotment addition only for the calendar year in which the body of water is filled.*

4. Removed Acreage Addition

A turf-related facility that removes acres of water-intensive landscaped area in existence within the facility prior to January 1, 1990 shall receive an allotment addition equal to the allotment the acres would have received pursuant to the 4MP if they had not been removed, provided that the acres were given a water allotment in the 1MP, the 2MP, the 3MP, or the 4MP.

5. Leaching Allotment Addition

The owner or operator of a turf-related facility may apply to the Director for an allotment addition for leaching purposes. The Director shall approve the application if the water supply used for landscape watering at the facility contains at least 1,000 milligrams per liter of total dissolved solids. If the Director approves an allotment addition for leaching purposes, the Director shall calculate the additional allotment as follows:

Leaching Allotment Addition:

$$\left(\frac{1}{1 - \left(\frac{EC_w}{5EC_e - EC_w} \right)} - 1 \right) \times \frac{CU}{0.85}$$

Where:

EC_w = Electrical conductivity of water used

EC_e = Tolerance of the grass species grown to the soil salinity in electrical conductivity of the soil saturation extract

CU = Consumptive use requirement for the grass species

Any allotment addition granted under this subsection shall remain in effect until the water supply used for landscape watering at the facility contains less than 1,000 milligrams per liter of total dissolved solids or until the first compliance date for the facility's conservation requirements in the SMP, whichever occurs first.

6. Allotment Addition for Additional Low Water Use Landscaped Area and Turfed Acres Within Post-1985 Turf-Related Facilities that are Regulation Golf Courses

a. The owner or operator of a post-1985 turf-related facility that is a regulation golf course shall receive an allotment addition for additional low water use landscaped area and turf acres if the total low water use landscaped area and turf acres within the facility exceeds an area calculated by multiplying the number of holes within the facility by five acres. The amount of the allotment addition shall be calculated pursuant to subparagraph b of this paragraph and shall be subject to the conditions set forth in subparagraphs c and d of this paragraph.

b. The allotment addition allowed under subparagraph a of this paragraph shall be calculated as follows:

- 1) Determine the facility's "base allotment acres." The facility's base allotment acres are the total turf acres and low water use landscaped area within the facility, up to a maximum of five acres per hole. In determining the base allotment acres, turf acres shall be counted first.*
- 2) Determine the turf acres and low water use landscaped area within the facility that are not included within the base allotment acres.*
- 3) Multiply the turf acres determined in item 2) above by an application rate of 3.0 ac-ft per acre. Multiply the low water use landscaped area determined in item 2) above by an application rate of 1.5 ac-ft per acre.*
- 4) Add the products in item 3) above. The allotment addition allowed by subparagraph a of this paragraph is the sum of the products in item 3) or an amount calculated by multiplying the number of holes within the facility by five ac-ft, whichever is less.*

- c. *Any allotment addition allowed under subparagraph a of this paragraph shall apply during the seventh through tenth calendar years after the turf-related facility commences landscape watering only if one of the following applies:*
- 1) *Direct use reclaimed water or reclaimed water recovered within the area of impact is used within the facility for landscape watering purposes during the year in an amount equal to or greater than the amount of the allotment addition.*
 - 2) *The owner or operator of the facility extinguishes long-term storage credits earned for the storage of reclaimed water or Central Arizona Project water within the Pinal Active Management Area pursuant to a storage permit issued under title 45, chapter 3.1, Arizona Revised Statutes, in the following amount: a) during the seventh and eighth calendar years after the facility commences landscape watering, the difference between the allotment addition and the amount of direct use reclaimed water or reclaimed water recovered within the area of impact used within the facility for landscape watering purposes during the year; and b) during the ninth and tenth calendar years after the facility commences landscape watering, an amount calculated by multiplying 1.5 by the difference between the allotment addition and the amount of direct use reclaimed water or reclaimed water recovered within the area of impact used within the facility for landscape watering purposes during the year. Proof of extinguishment shall be included in the facility's annual water use report required by A.R.S. § 45-632.*
- d. *Any allotment addition allowed under subparagraph a of this paragraph shall apply in any year subsequent to the tenth calendar year after the turf-related facility commences landscape watering only if direct use reclaimed water or reclaimed water recovered within the area of impact is used within the facility for landscape watering purposes during the year in an amount equal to or greater than the amount of the allotment addition.*

E. Combined Allotments for Contiguous Facilities

The maximum annual water allotments for contiguous turf-related facilities under one ownership or operation may be combined. All or a portion of the combined maximum water allotment may be applied to any part of the contiguous facilities.

- F. *Nothing in this section shall be construed as authorizing use of more groundwater or surface water than may be used pursuant to any groundwater or appropriable water rights or permits associated with the use. Nor shall this section be construed as authorizing use of groundwater or surface water in any manner that violates Chapter 1 or Chapter 2 of Title 45, Arizona Revised Statutes.*

6-704. Compliance with Maximum Annual Water Allotment

A. Reclaimed Water Use Adjustment

For purposes of determining compliance with the maximum annual water allotment requirement, the Director shall count each acre-foot of direct use reclaimed water or reclaimed water recovered within the area of impact used at the facility for landscape watering purposes during the calendar year as 0.7 acre-foot of water.

B. Flexibility Account

The Director shall determine if a turf-related facility is in compliance with the maximum annual water allotment requirement through the maintenance of a flexibility account for the facility according to the following:

- 1. Beginning with calendar year 2002 or the first full calendar year after the commencement of landscape watering, whichever is later, a flexibility account shall be established for a turf-related facility with a beginning balance of zero ac-ft.*
- 2. Following each calendar year in which groundwater is withdrawn, diverted, or received for landscape watering purposes at the facility, the Director shall adjust the turf-related facility's flexibility account as follows:*
 - a. Subtract the total volume of water from any source, including reclaimed water, as adjusted under subsection A of this section, used by the facility for landscape watering purposes during that calendar year, from the facility's maximum annual water allotment for that year.*
 - b. If the result in subparagraph a of this paragraph is positive, credit the flexibility account by this volume.*
 - c. If the result in subparagraph a of this paragraph is negative, debit the flexibility account by this volume.*
- 3. The account balance existing in a turf-related facility's flexibility account after the adjustment provided for in paragraph 2 of this subsection is made shall carry forward subject to the following limitations:*
 - a. The maximum positive account balance allowed in the flexibility account of a turf-related facility after any credits are registered pursuant to paragraph 2, subparagraph b of this subsection, shall be calculated by multiplying the facility's maximum annual water allotment for the calendar year for which the credits are registered by 0.2. If the account balance exceeds the maximum positive account balance after the credits are registered, the balance carried forward shall be equal to the maximum positive account balance.*
 - b. The maximum negative account balance allowed in the flexibility account of a turf-related facility after any debits are registered pursuant to paragraph 2, subparagraph c of this subsection shall be calculated by multiplying the facility's maximum annual water allotment for the calendar year for which the debits are registered by -0.2. If the account balance is less than the maximum negative account balance after the debits are registered, the balance carried forward shall be equal to the maximum negative account balance.*

C. Compliance Status

If the adjustment to a turf-related facility's flexibility account following a calendar year as provided for in subsection B, paragraph 2 of this section, causes the account to have a negative

account balance less than the maximum negative account balance allowed in the flexibility account for the calendar year as calculated in subsection B, paragraph 3, subparagraph b of this section, the industrial user who uses water at the facility is in violation of the facility's maximum annual water allotment for that calendar year in an amount equal to the difference between the facility's flexibility account balance and the maximum negative balance allowed in the facility's flexibility account.

6-705. Monitoring and Reporting Requirements

- A. *An industrial user who uses water at a turf-related facility that commences landscape watering within any post-1985 acres after January 1, 2020 shall submit to the Director documentation of the new acreage within the facility no later than 90 days after commencing landscape watering within the new acres or receiving notice of these conservation requirements, whichever is later. The scale of the submitted documents, extent of turf acres, water surface acres, and low water use landscaped area must clearly be shown. Documentation may consist of one or more of the following:*
- 1. As-built plans certified by a registered professional such as a civil engineer, golf course designer, or landscape architect.*
 - 2. Aerial photography at a scale no smaller than 1" = 200'.*
 - 3. A survey of the facility certified by a registered professional such as a civil engineer or land surveyor.*
 - 4. Any other documentation upon approval by the Director.*
- B. *For calendar year 2020 or the calendar year in which landscape watering commences, whichever occurs later, and for each calendar year thereafter until the first compliance date for any substitute monitoring and reporting requirement in the 5MP, an industrial user who uses water at a turf-related facility shall include in the annual report required by A.R.S. § 45-632 the following information:*
- 1. The total quantity of water by source, disaggregated by source, withdrawn, diverted, or received during the calendar year for landscape watering purposes at the facility, as measured with a measuring device in accordance with ADWR's measuring device rules, A.A.C. R12-15-901, et seq.*
 - 2. The total quantity of reclaimed water, disaggregated by direct use reclaimed water, reclaimed water recovered within the area of impact, and reclaimed water recovered outside the area of impact that was withdrawn or received during the calendar year for landscape watering purposes at the facility, as measured with a measuring device in accordance with ADWR's measuring device rules, A.A.C. R12-15-901, et seq.*
 - 3. The number of turf acres within the facility during the calendar year, not including newly turfed area.*
 - 4. The number of acres of total water surface area within the facility during the calendar year.*

5. *The number of acres of low water use landscaped area within the facility during the calendar year.*
 6. *The number of acres of newly turfed area within the facility during the calendar year.*
 7. *The number of turf acres removed within the facility during the calendar year.*
 8. *The number of acres of total water surface area added or removed within the facility during the calendar year.*
 9. *The number of acres of low water use landscaped area added or removed within the facility during the calendar year.*
 10. *If the facility is a golf course, the length of the course as measured from the back of each tee ground furthest from the associated green, then down the center line of the hole to the center of the green.*
 11. *The number of acres approved by the Director for a revegetation addition pursuant to section 6-703, subsection D, paragraph 2, within the facility during the calendar year.*
 12. *The quantity of water used to fill or refill a body of water within the facility during the calendar year for which an allotment addition is sought pursuant to section 6-703, subsection D, paragraph 3.*
 13. *The number of acres of overseeded area within the facility during the calendar year.*
 14. *If the facility is a golf course, the number of holes within the facility during the calendar year.*
 15. *If the facility is a golf course, the number of holes added during the calendar year.*
 16. *If the facility is a golf course that qualifies as a pre-1986 turf-related facility, the number of acres of turf acres, low water use landscape area and water surface acres added to the facility after December 31, 1985, and the number of holes added to the facility after December 31, 1985.*
 17. *An estimate of the quantity of water from any source, including reclaimed water, used for each purpose other than landscape watering purposes at the facility during the reporting year. Any water used at the facility that is not measured separately from the water used for landscape watering shall be counted by the Director as water used by the facility for landscape watering for purposes of calculating the compliance with the maximum annual water allotment.*
- C. *A single annual report may be filed for contiguous turf-related facilities that are under the same ownership or operation if the allotments for the contiguous facilities are combined pursuant to section 6-703, subsection E. The annual report shall report water use and landscaped areas of the contiguous facilities as required in subsection B of this section.*

6.8**INDUSTRIAL CONSERVATION REQUIREMENTS AND MONITORING AND REPORTING REQUIREMENTS FOR SAND AND GRAVEL FACILITIES**

6-801. Definitions

In addition to the definitions set forth in Chapters 1 and 2 of Title 45 of the Arizona Revised Statutes and section 6-601 of this chapter, unless the context otherwise requires, the following words and phrases used in sections 6-802 and 6-803 of this chapter shall have the following meanings:

1. *“Alternative water supply” means a water source other than groundwater of drinking water quality.*
2. *“Sand and gravel facility” means a facility that produces sand and gravel and that uses more than 100 ac-ft of water from any source per calendar year. For purposes of this definition, the annual water use shall include all water used by the facility regardless of the nature of the use.*
3. *“Rock out method” means agitating rock inside concrete truck mixer drums for the purpose of cleaning excess concrete from the drums.*
4. *“Wash water” means water used for washing or sorting sand, gravel, or other aggregates.*

6-802. Conservation Requirements**A. Standard Conservation Requirements**

Beginning on January 1, 2020 or upon commencement of water use, whichever occurs later, and continuing thereafter until the first compliance date for any substitute conservation requirements in the SMP, an industrial user who uses water at a sand and gravel facility shall comply with the following conservation requirements:

1. *If sufficient land area for construction and operation of disposal ponds is available at a reasonable price, the industrial user shall construct disposal ponds at the sand and gravel facility. All wash water, all water used for wet scrubbers at asphalt plants, all runoff from cleanup operations and all drainage from sand and gravel piles shall be discharged or diverted into the disposal ponds unless prohibited by state or federal environmental regulations. The disposal ponds shall contain a barge pump or sump pump of sufficient capacity, together with any necessary additional equipment, to assure the maximum reclamation of the water. The water shall be reclaimed and reused at the sand and gravel facility unless prohibited by state or federal regulations.*
2. *If sufficient land area for the construction and operation of disposal ponds is not available at a reasonable price, clarifiers shall be used at the sand and gravel facility for reclaiming wash water, all water used for wet scrubbers at asphalt plants, runoff from cleanup operations and all drainage from sand and gravel piles. The clarifiers shall be designed and operated to assure the maximum reclamation of water. The water shall be reclaimed and reused at the sand and gravel facility unless prohibited by state or federal regulations.*
3. *At least one of the following techniques or technologies designed to reduce water use for dust control shall be implemented at the sand and gravel facility:*
 - a. *The placement of binding agents on all haul roads;*

- b. The paving of all haul roads;*
- c. The placement of recycled asphalt on all haul roads;*
- d. The placement of medium sized aggregate or “pea gravel” on all haul roads; or*
- e. A technology or technique designed to reduce water use for dust control not included in subparagraphs a through d of this paragraph that demonstrates water savings equivalent to any of the technologies or techniques listed in subparagraphs a through d, and that has been approved by the Director.*

The industrial user shall have sole discretion in determining whether to implement more than one of the above technologies.

- 4. At least one of the following techniques or technologies designed to reduce water use for cleaning shall be implemented at the sand and gravel facility:*
 - a. Use of metered timers for truck washing and other cleanup activities;*
 - b. Use of the “rock out method” of cleaning concrete from truck mixer drums;*
 - c. Use of concrete set-arresting agent chemical applications to clean concrete from truck mixer drums; or*
 - d. A technology or technique designed to reduce water use for cleaning that is not included in subparagraphs a through c of this paragraph that demonstrates water savings equivalent to any of the measures listed in subparagraphs a through c and that has been approved by the Director.*

The industrial user shall have sole discretion in determining whether to implement more than one of the above technologies.

B. Substitute Conservation Requirements

- 1. An industrial user who uses water at a sand and gravel facility may apply to the Director to use conservation technologies other than the standard conservation requirements prescribed in subsection A of this section. The Director may approve the use of substitute conservation technologies if both of the following apply:*
 - a. The industrial user has submitted a detailed description of the proposed substitute technologies and the water savings that can be achieved by the use of those technologies; and*
 - b. The Director determines that the proposed substitute conservation technologies will result in a water savings equal to or greater than the savings that would be achieved by the standard conservation requirements prescribed in subsection A of this section.*
- 2. If the Director approves an industrial user’s request to use conservation technologies other than the standard conservation requirements prescribed in subsection A of this section, the*

industrial user shall comply with the substitute conservation technologies approved by the Director beginning on the date determined by the Director and continuing until the first compliance date for any substitute conservation requirement in the 5MP.

C. Conservation Plan

- 1. Not later than 180 days after receiving notice of these conservation requirements, an industrial user who uses water at a sand and gravel facility, including an industrial user who acquires ownership of an existing sand and gravel facility after the first compliance date of the 4MP, shall submit to the Director a plan to improve the efficiency of water use at the facility on a form provided by the Director. The plan shall analyze the economic feasibility of implementing all of the following at the facility:*
 - a. Disposal pond surface area reduction;*
 - b. The use of clarifiers for recycling water;*
 - c. Use of a renewable water supply if such a supply is available within a one mile radius of the facility.*
- 2. The economic analysis must analyze the potential costs and savings associated with the following:*
 - a. Labor (including planning, construction, operation, maintenance, and management time);*
 - b. Equipment (values amortized over the projected life of the equipment);*
 - c. Land value (including value of mineral reserves);*
 - d. Water costs (including pumping costs, well maintenance, and withdrawal taxes);*
 - e. Costs for chemicals and raw materials;*
 - f. Fuel or energy costs;*
 - g. Industrial wastewater disposal costs;*
 - h. Changes in revenue caused by changing production rate, minimizing “down-time” or increasing the size of reserves;*
 - i. Regulatory permitting costs.*

6-803. Monitoring and Reporting Requirements

For calendar year 2020, or the calendar year in which the sand and gravel facility first commences using water, whichever is later, and for each calendar year thereafter until the first compliance date for any substitute monitoring and reporting requirement in the 5MP, an industrial user who uses water at a sand and gravel facility shall include the following information in its annual report required by A.R.S. § 45-632:

- 1. The quantity of water reclaimed from disposal ponds or clarifiers during the calendar year, as measured with a measuring device in accordance with ADWR’s measuring device rules, A.A.C. R12-15-901, et seq.*
- 2. The quantity of water from any source, including reclaimed water, supplied to the wash plant during the calendar year, as measured with a measuring device in accordance with ADWR’s measuring device rules, A.A.C. R12-15-901, et seq.*

3. *The quantity of water from any source, including reclaimed water, supplied to the asphalt plant during the calendar year, as measured with a measuring device in accordance with ADWR's measuring device rules, A.A.C. R12-15-901, et seq.*
4. *The aggregate surface area of any disposal ponds.*
5. *The average depth of any disposal ponds.*
6. *The estimated quantity of water from any source, including reclaimed water, used during the calendar year for:*
 - a. *Industrial process purposes. Water used for industrial process purposes includes water used for sanitary waste disposal but does not include water used for cooling and cleaning purposes.*
 - b. *Non-domestic cooling purposes.*
 - c. *Non-domestic cleaning purposes. Water use for non-domestic purposes includes truck washing, truck mixer drum washing, or other non-domestic cleaning purposes.*
 - d. *Road dust control.*
 - e. *Landscape watering.*
 - f. *Other purposes.*
7. *The tonnage of material washed during the calendar year.*

6.9 INDUSTRIAL CONSERVATION REQUIREMENTS AND MONITORING AND REPORTING REQUIREMENTS FOR METAL MINING FACILITIES

6-901. Definitions

In addition to the definitions set forth in Chapters 1 and 2 of Title 45 of the Arizona Revised Statutes, unless the context otherwise requires, the following words and phrases shall have the following meanings:

1. *"Abandoned tailings impoundment" means a tailings impoundment that the owner/operator of a metal mining facility does not plan to use for additional disposal of tailings.*
2. *"Alternative water supply" means a water source other than groundwater of drinking water quality.*
3. *"Decant water" means water removed from the stilling basin of a tailings impoundment either by gravity flow into a decant tower or by pumping.*

4. *“Heap and dump leaching” means the extraction of minerals using acid solutions applied to metallic ores that have been removed from their original location and heaped or dumped in a new location.*
5. *“In situ leaching” means the extraction of metallic ores using acid leaching of ores that are not moved from their original natural location.*
6. *“In situ leaching sites” mean those portions of metal mining facilities at which in situ leaching and associated copper recovery operations occur, including surface applications of acid leaching solutions and deep well injection of acid leaching solutions.*
7. *“Large-scale metal mining and processing facility” means an industrial facility at which mining and processing of metallic ores is conducted and that uses or has the potential to use more than 500 ac-ft of water per reporting year. For the purposes of this definition, the annual water use or potential annual water use includes all water from any source, including reclaimed water, used or projected to be used within or by the facility, regardless of the nature of the use.*
8. *“Mill concentrator” means the structure at open-pit metal mines within which metallic ore is crushed and the flotation process is used to remove minerals.*
9. *“Mill circuit” means the flow of water used in the process of crushing ore, recovering copper at the mill concentrator, and transporting and disposing of tailings, and includes recovery of water at the tailings impoundments for reuse in the mill concentrator.*
10. *“Post-1985 metal mining facility” means either:*
 - a. *A large-scale metal mining and processing facility that does not qualify as a pre-1986 metal mining facility, including any expanded or modified portion of the facility; or*
 - b. *Any expanded or modified portion of a pre-1986 metal mining facility if the expansion or modification includes one or more new tailings impoundments, new mill circuits, or new leaching facilities, and was not substantially commenced as of December 31, 1985.*
11. *“Pre-1986 metal mining facility” means a large-scale metal mining and processing facility at which the mining and processing of metallic ores was occurring as of December 31, 1985 or which was substantially commenced as of December 31, 1985 and includes any expanded or modified portion of such a facility if the expansion or modification includes one or more new tailings impoundments, new mill concentrator circuits, or new wells, and was substantially commenced as of December 31, 1985.*
12. *“Seepage water” means water that has infiltrated from tailings impoundments into the material underlying the tailings impoundments.*
13. *“Substantially commenced as of December 31, 1985” means, with regard to the construction, expansion, or modification of a large-scale metal mining and processing facility, that the owner or operator of the facility had obtained all pre-construction permits and approvals required by federal, state, or local governments for the construction, expansion, or modification of the facility by December 31, 1985, or had made a substantial*

capital investment in the physical on-site construction of the project in the 12 months prior to December 31, 1985.

14. *“Tailings” mean the slurry of water and fine-grained waste rock material remaining after minerals have been removed in the mill concentrator and excess water has been recovered and returned to the mill concentrator.*
15. *“Tailings impoundment” means the final disposal site for tailings generated in the milling circuit.*

6-902. Conservation Requirements for Pre-1986 Metal Mining Facilities

Beginning on January 1, 2020 and continuing thereafter until the first compliance date for any substitute conservation requirement in the 5MP, an industrial user who uses water at a pre-1986 metal mining facility shall comply with the following requirements:

A. Management of Tailings Density

The industrial user shall transport tailings to the tailings impoundment area at the maximum density possible consistent with reasonable economic return; but, beginning with calendar year 2020, the three-year average density of the tailings during transport shall be 48 percent solids by weight or greater during the period consisting of the reporting year and the previous two years. The Director may reduce the density required for a period of time determined by the Director if the industrial user demonstrates that, due to the shutdown of ore processing or tailings transport equipment or due to the density of ore being mined, a three-year average density of 48 percent or greater cannot be achieved.

B. Management of Pre-sliming/Interceptor Wells

The industrial user shall comply with one of the following:

1. *Deposit a layer of tailings immediately up-slope from the free water level in each tailings impoundment. The tailings layer shall be 12 inches or more in thickness and shall minimize soil surface permeability.*
2. *Drill interceptor wells down-gradient from each tailings impoundment. The interceptor wells shall be designed, located, and operated in such a manner as to intercept the maximum amount of seepage water possible from each tailings impoundment. Water recovered from the interceptor wells shall be reused at the mining facility.*

C. Management of Water in Tailings Impoundments

The industrial user shall minimize the free water surface area in each tailings impoundment by complying with all of the following:

1. *Manipulate tailings that have been disposed of in a tailings impoundment, and manage new disposal of tailings in an impoundment, to create stilling basins that increase the rate of recovery of decant water from the stilling basins, and to minimize the free water surface area of stilling basins.*

2. *Use decant towers, barge pumps, or sump pumps to recycle water from each tailings impoundment back to the mill concentrator.*
3. *Expand decant tower barge pumping capacity where necessary to increase the capacity to recycle water from each tailings impoundment back to the mill concentrator.*
4. *Use, to the maximum extent possible, tailings impoundment water rather than pumping additional groundwater.*

D. *Capping Abandoned Tailings Impoundments*

The industrial user shall cap each abandoned tailings impoundment in a manner that minimizes the quantity of water used for dust control purposes and/or revegetation.

E. *Heap and Dump Leaching*

The industrial user shall apply water to heap and dump leaching operations in a manner that minimizes water use to the extent practicable, consistent with reasonable economic return.

F. *Additional Conservation Measures*

An industrial user who uses water at a metal mining facility shall comply with three of the following eight conservation measures at those portions of the facility that do not qualify as in situ leaching sites:

1. *When revegetating abandoned mine-related areas, utilize drought-tolerant vegetation.*
2. *Utilize multiple decant towers in single impoundments to increase decant rate.*
3. *Convert piping to high density polyethylene piping to increase density of transported tailings.*
4. *Harvest and reuse storm water runoff on site.*
5. *Reuse pit dewatering water.*
6. *Reduce evaporation from free-standing water surfaces in addition to evaporation reduction from stilling basins.*
7. *Reduce water used for dust control by reducing the number and extent of haul trips, using road binders, converting to conveyors for material transport, or using another dust control measure that reduces water use.*
8. *Reduce water used for delivery of acid/water solution for heap or dump leaching operations by using delivery methods that use less water than sprinkler delivery.*

6-903. *Conservation Requirements for Post-1985 Metal Mining Facilities*

Beginning on January 1, 2020 or upon commencement of operations at the facility, whichever is later, and continuing thereafter until the first compliance date for any substitute conservation

requirement in the 5MP, an industrial user who uses water at a post-1985 metal mining facility shall comply with conservation requirements applicable to pre-1986 metal mining facilities as prescribed in section 6-902, subsections C through F, and the following additional requirements:

A. Management of Tailings Impoundments

The industrial user shall design and construct any post-1985 tailings impoundments to maximize recovery of water from the stilling basins and to minimize seepage water. Any interceptor wells down gradient of tailings impoundments shall be constructed to maximize recovery of seepage water.

B. Management of Tailings Density

The industrial user shall design, construct, and operate any post-1985 mill concentrators and their associated tailings transport systems to achieve the maximum tailings densities possible consistent with reasonable economic return, but the average annual density of tailings during transport shall not be less than 50 percent solids by weight.

C. Management of In Situ Leaching

The industrial user shall utilize water for in situ leaching in a manner that minimizes water use to the extent practicable, consistent with reasonable economic return.

6-904. Alternative Conservation Program

An industrial user who uses water at a metal mining facility may apply to the Director to use conservation technologies other than the technologies prescribed in sections 6-902 and 6-903, whichever is applicable. The Director may approve the use of alternative conservation technologies if the Director determines that both of the following apply:

- 1. The industrial user has filed with the Director a detailed description of the proposed alternative technologies and the water savings that can be achieved by the use of these technologies.*
- 2. The industrial user has demonstrated to the satisfaction of the Director that the latest commercially available conservation technology consistent with reasonable economic return will be used.*

6-905. Modification of Conservation Requirements for Metal Mining Facilities

- A.** *An industrial user who uses water at a metal mining facility may apply to the Director to modify conservation requirements prescribed in sections 6-902 and 6-903, whichever is applicable, for any year in which compliance with the conservation requirements would likely result in violation of any federal, state, or local environmental standards or regulations. To apply for a modification of conservation requirements, an industrial user shall submit a request in writing to the Director that includes the following information:*

1. *Documentation describing the conservation requirement(s) for which compliance with this requirement is likely to result in violation of environmental standards and the environmental standards that are likely to be violated.*
 2. *The proposed modification to the conservation requirements.*
- B. *The Director shall grant a request for modification of conservation requirements if the Director determines that compliance with the conservation requirements prescribed in sections 6-902 and 6-903, whichever is applicable, would likely result in a violation of any federal, state, or local environmental standards or regulations.*

6-906. *Preparation of a Long-Range Conservation Plan for Metal Mining Facilities*

By January 1, 2020 or three months prior to commencement of operations at the facility, whichever is later, an industrial user who uses water at a metal mining facility shall submit to the Director an updated long-range water conservation plan that describes the existing or planned design, construction, and operation of the facility, including a description of the ore type, method of mining, and method of metal extraction. The plan shall include an evaluation of the use of the latest commercially available conservation technology consistent with reasonable economic return. Prior to submitting the plan, the industrial user shall analyze the feasibility of applying the following conservation practices or technologies at the mine and shall report the results in the plan:

1. *Using alternative water sources for mining and metallurgical needs, including determining the source and volume of the alternative water sources being analyzed.*
2. *Reducing tailings impoundment evaporation through the application of the latest commercially available technologies for minimizing evaporation from the impoundments and through the application of improved tailings management.*
3. *Minimizing water use for dust suppression through the use of road binders, conveyors, paved haul roads, and other available dust control mechanisms.*
4. *Increasing tailings densities to 55 percent solids or greater by weight.*

The industrial user may include any additional conservation techniques or technologies in the plan. The plan shall include a schedule of the approximate dates for implementation of any conservation practices or technologies that the industrial user intends to implement.

6-907. *Monitoring and Reporting Requirements for Metal Mining Facilities*

A. *Water Measurement and Reporting*

For calendar year 2020 or the calendar year in which the facility commences operation, whichever is later, and for each calendar year thereafter until the first compliance date for any substitute requirement in the 5MP, an industrial user who uses water at a metal mining facility shall include in its annual report required by A.R.S. § 45-632 the following information:

1. *The quantity of water from any source, including reclaimed water, used during the calendar year for each of the following purposes: dust control, tailings revegetation,*

domestic use, and transportation of tailings to tailings impoundments. The quantity of water used for dust control and tailings revegetation shall be separately measured with a measuring device in accordance with ADWR's measuring device rules, A.A.C. R12-15-901, et seq. The quantity of water used for domestic use and transportation of tailings to tailings impoundments may be estimated.

- 2. The quantity of make-up water from any source, including reclaimed water, used during the calendar year for each of the following purposes: equipment washing, leaching operations, and milling operations, as separately measured with a measuring device in accordance with ADWR's measuring device rules, A.A.C. R12-15-901, et seq.*
- 3. The quantity of water from any source, including reclaimed water, reclaimed during the calendar year from each of the following: tailings impoundments and pit dewatering. These quantities shall be separately measured with a measuring device in accordance with ADWR's measuring device rules, A.A.C. R-12-15-901, et seq.*
- 4. The tons of ore milled during the calendar year.*
- 5. The tons of ore stacked to heap and/or dump leach during the calendar year.*
- 6. The tons of ore vat leached during the calendar year.*
- 7. The tons of material mined during the calendar year.*
- 8. The tons of mineral produced from mill circuits and from leach circuits during the calendar year.*
- 9. The average gallons of water consumed per ton of mineral produced during the calendar year.*
- 10. The average percentage of solids by weight in tailings transported to the tailings impoundments during the calendar year and in each of the previous two years.*
- 11. The average annual depth of water at the deepest portion of the stilling basin(s).*
- 12. Copies of aerial photos of tailings impoundments, with scale indicated, for use by ADWR in determining the wetted surface area of the tailings impoundments.*
- 13. A description of the additional conservation measures applied at the metal mining facility as prescribed in section 6-1902, subsection F.*

B. Contiguous Facilities

A single annual report may be filed for a pre-1986 metal mining facility and a post-1985 metal mining facility that are contiguous and owned by the same owner. The combined operations of the metal mining facilities shall be described pursuant to reporting requirements specified in subsection A of this section.

6.10 INDUSTRIAL CONSERVATION REQUIREMENTS AND MONITORING AND REPORTING REQUIREMENTS FOR LARGE-SCALE POWER PLANTS

6-1001. Definitions

In addition to the definitions set forth in Chapters 1 and 2 of Title 45 of the Arizona Revised Statutes and section 6-601 of this chapter, unless the context otherwise requires, the following words and phrases shall have the following meanings:

1. *“Blowdown water” means water discharged from a cooling tower recirculating water stream to control the buildup of minerals or other impurities in the recirculating water.*
2. *“Combustion turbine electric power plant” means an industrial facility that produces or is designed to produce more than 25 megawatts of electricity by utilizing an internal combustion engine in which the expanding gases from the combustion chamber drive the blades of a turbine which turns a generator to produce electricity.*
3. *“Conservative mineral constituent” means a component of recirculating water in a cooling tower, the concentration of which is not significantly modified by precipitation, loss to the atmosphere, or the addition of treatment chemicals.*
4. *“Continuous blowdown and make-up” means patterns in cooling tower operation that include continuous blowdown and make-up or frequent periodic blowdown and make-up of recirculating water.*
5. *“Cycles of concentration” means the ratio of the concentration of total dissolved solids, other conservative mineral constituent, or electrical conductivity in the blowdown water to the concentration of this same constituent or electrical conductivity in the make-up water. This can be calculated by dividing the total make-up water by the total blowdown water.*
6. *“Fully operational cooling tower” means a cooling tower that is functioning to dissipate heat from a large-scale power plant that is generating electricity.*
7. *“Large-scale power plant” means an industrial facility that produces or is designed to produce more than 25 megawatts of electricity including steam electric power plants and combustion turbine plants.*
8. *“Limiting constituent” means a chemical, physical, or biological constituent present in recirculating cooling tower water that, due to potential physical or biological factors or due to potential exceedence of any federal, state, or local environmental standards upon discharge as blowdown, should not be allowed to accumulate in recirculating cooling tower water above a certain concentration.*
9. *“Make-up water” means the water added back into the cooling tower recirculating water stream to replace water lost to evaporation, blowdown, or other mechanisms of water loss.*
10. *“Reclaimed water-served cooling tower” means a cooling tower served by a make-up water supply that on an annual average basis consists of 50 percent or more reclaimed water.*
11. *“Steam electric power plant” means an industrial facility that produces or is designed to produce more than 25 megawatts of electricity by utilizing the Rankin Steam Cycle in which*

water is heated, turns into steam and spins a steam turbine which drives an electrical generator.

6-1002. Conservation Requirements for Steam Electric Power Plants

A. Conservation Requirements

Beginning on January 1, 2020 or upon commencement of water use, whichever occurs later, and continuing thereafter until the first compliance date for any substitute conservation requirement in the 5MP, an industrial user who uses groundwater at a steam electric power plant shall comply with the following requirements:

- 1. An annual average of 15 or more cycles of concentration shall be achieved during periods when the steam electric power plant is generating electricity.*
- 2. The maximum amount of wastewater feasible, excluding blowdown water and sanitary wastewater, shall be diverted to the cooling process so long as this stream does not have a negative impact on the cycles of concentration or any other environmental requirement.*

B. Cycles of Concentration Adjustment Due to the Quality of Recirculating Water

An industrial user who uses groundwater at a steam electric power plant may apply to the Director for an adjustment to the cycles of concentration requirements set forth in subsection A of this section if compliance with the cycles of concentration requirements would likely result in damage to cooling towers or associated equipment or exceedence of federal, state or local environmental discharge standards because of the quality of recirculating water. To apply for an adjustment to the cycles of concentration requirements based on recirculating water quality, an industrial user shall submit a request in writing to the Director that includes the following information:

- 1. Historic, current and projected water quality data for the relevant constituent(s).*
- 2. Documentation describing the potential damage to cooling towers or associated equipment, or documentation of environmental standards that are likely to be exceeded, whichever applies.*

The Director shall grant the request if the Director determines that compliance with the cycles of concentration requirements set forth in subsection A of this section would likely result in damage to cooling towers or associated equipment or exceedence of federal, state, or local environmental discharge standards because of the quality of recirculating water. Any cycles of concentration adjustment granted pursuant to this subsection shall apply only while the quality of recirculating water would cause compliance with the cycles of concentration requirements to likely result in damage to cooling towers or associated equipment or exceedence of federal, state or local environmental discharge standards.

C. Exemption and Cycles of Concentration Adjustment Due to the Quality of Reclaimed Water Make-up Water Supplies

- 1. The cycles of concentration requirements set forth in subsections A and B of this section do not apply to any reclaimed water-served cooling tower at a steam electric power plant*

during the first 12 consecutive months in which more than 50 percent of the water supplied to the cooling tower is reclaimed water.

2. *Within 30 days after the 12-month exemption period expires, the industrial user who uses water at the steam electric power plant may apply to the Director for a cycles of concentration adjustment to lower the cycles of concentration requirement for the reclaimed water-served cooling tower if compliance with the requirement would not be possible due to the presence of a limiting constituent in the reclaimed water supplying the tower. To apply for an alternative cycles of concentration requirement to address such a limiting constituent, an industrial user shall submit a request in writing to the Director that includes the following information:*
 - a. *The limiting constituent(s) that is present in the reclaimed water supplying the tower that results in the need to blow down a greater annual volume of water than that required in subsection A of this section.*
 - b. *Documentation describing the concentration at which this limiting constituent(s) should be blown down and the reason for the alternative cycles of concentration.*

The Director shall grant the request if the Director determines that the presence of a limiting constituent in the reclaimed water supplying the cooling tower results in the need to blow down a greater annual volume of water than that required in subsection A of this section. Any cycles of concentration adjustment granted pursuant to this paragraph shall apply only while the tower qualifies as a reclaimed water-served cooling tower.

D. Substitute Conservation Requirements

1. *An industrial user who uses groundwater at a steam electric power plant may apply to the Director to use conservation technologies other than the standard conservation requirements prescribed in subsection A of this section. The Director may approve the use of substitute conservation technologies if both of the following apply:*
 - a. *The industrial user has submitted a detailed description of the proposed substitute technologies and the water savings that can be achieved by the use of those technologies, and;*
 - b. *The Director determines that the proposed substitute conservation technologies will result in a water savings equal to or greater than the savings that would be achieved by the standard conservation requirements prescribed in subsection A.*
2. *If the Director approves an industrial user's request to use conservation technologies other than the standard conservation requirements prescribed in subsection A of this section, the industrial user shall comply with the substitute conservation technologies approved by the Director beginning on the date determined by the Director and continuing until the first compliance date for any substitute conservation requirement in the SMP.*

E. Waiver

An industrial user who uses groundwater at a steam electric power plant may apply to the Director for a waiver of any applicable conservation requirement in subsection A of this section

by submitting a detailed, long-term plan for beneficial reuse of 100 percent of blowdown water outside the cooling circuit, including an implementation schedule. Reuse of blowdown water includes the discharge of blowdown water into pipes, canals, or other means of conveyance if the discharged water is transported to another location at the plant or off the plant for reuse.

The Director shall grant a waiver request if the Director determines that implementation of the plan will result in the beneficial reuse of 100 percent of blowdown water outside the cooling circuit. If a waiver request is granted, the industrial user shall implement the plan in accordance with the implementation schedule submitted to and approved by the Director.

6-1003. Conservation Requirements for Combustion Turbine Electric Power Plants

- A. *Beginning on January 1, 2020 or upon commencement of water use, whichever occurs later, and continuing thereafter until the first compliance date for any substitute conservation requirement in the SMP, an industrial user who uses groundwater at a combustion turbine electric power plant shall comply with the following requirement:*

Each fully operational cooling tower with greater than or equal to 250 tons of cooling capacity at the combustion turbine electric power plant facility shall achieve a cycles of concentration level that results in blowdown water being discharged at an average annual minimum of either 120 milligrams per liter (mg/L) silica or 1,200 mg/L total hardness, whichever is reached first.

B. *Exemptions and Alternative Blowdown Standards*

1. *The requirement set forth in subsection A of this section does not apply to a combustion turbine electric power plant in any year in which the beneficial reuse exceeds the conservation requirement.*
2. *The requirement set forth in subsection A of this section does not apply to any reclaimed water-served cooling tower at a combustion turbine electric power plant during the first 12 consecutive months in which more than 50 percent of the water supplied to the cooling tower is reclaimed water.*

Within 30 days after the 12-month period expires, the person using water at the reclaimed water-served cooling tower may apply to the Director to use an alternative blowdown level from that required in subsection A of this section if compliance with the blowdown requirement would not be possible due to the presence of a limiting constituent other than silica or total hardness in the reclaimed water supplying the cooling tower. To apply for an alternative blowdown level to address such a limiting constituent, an industrial user shall submit a request in writing to the Director which includes the following information:

- a. *The limiting constituent other than silica or total hardness that is present in the reclaimed water supplying the cooling tower which results in the need to blow down a greater annual volume of water than that required under subsection A of this section.*
- b. *Documentation describing the concentration at which this limiting constituent should be blown down and the reason for the alternative blowdown level.*

The Director shall grant the request if the Director determines that the presence of a limiting constituent other than silica or total hardness in the reclaimed water supplying

the cooling tower results in the need to blow down a greater annual volume of water than that required under subsection A of this section. Any alternative blowdown level granted pursuant to this paragraph shall apply only while the cooling tower qualifies as a reclaimed water-served cooling tower.

3. *A combustion turbine electric power plant may apply to the Director to use an alternative blowdown level from that required in subsection A of this section if compliance with the blowdown requirement would likely result in damage to cooling towers or associated equipment or exceedance of federal, state or local environmental discharge standards because of the accumulation of a limiting constituent other than silica or total hardness in recirculating water. To apply for an alternative blowdown level for such a limiting constituent, an industrial user shall submit a request in writing to the Director which includes the following information:*

- a. *Historic, current and projected water quality data for the relevant limiting constituent(s).*
- b. *Documentation describing the potential damage to cooling towers or associated equipment, or documentation of environmental standards that are likely to be exceeded, whichever applies.*

The Director shall grant the request if the Director determines that compliance with the blowdown level set forth in subsection A of this section would likely result in damage to cooling towers or associated equipment or exceedance of federal, state, or local environmental discharge standards because of the accumulation of a limiting constituent other than silica or total hardness in recirculating water.

6-1004. Monitoring and Reporting Requirements

A. Monitoring and Reporting Requirements for Steam Electric Power Plants

1. *For calendar year 2020 or the calendar year in which water use first commences, whichever is later, and for each calendar year thereafter until the first compliance date for any substitute requirement in the 5MP, an industrial user who uses groundwater at a steam electric power plant shall include in its annual report required by A.R.S. § 45-632 the following information:*
 - a. *Source of water providing make-up water to each cooling tower at the facility.*
 - b. *For each cooling tower at the facility that is exempt from cycles of concentration requirements pursuant to section 6-902, subsection C, paragraph 1 or for which a cycles of concentration adjustment was granted pursuant to section 6-2002, subsection C, paragraph 2, the percentage of water served to the tower during the year that was reclaimed water.*
 - c. *For all fully operational cooling towers subject to cycles of concentration requirements under section 6-1002, subsection A:*

- i. *The total quantity of blowdown water discharged from the cooling towers for each month or partial month when the facility was generating electricity during the calendar year.*
 - ii. *The total quantity of make-up water used at cooling towers for each month or partial month when the facility was generating electricity during the calendar year.*
 - iii. *The weighted average concentration of total dissolved solids or other conservative mineral constituent in make-up water and blowdown water at the cooling towers for each month or partial month when the facility was generating electricity during the calendar year, either:*
 - 1) *Determined by direct analysis, or*
 - 2) *Calculated based on average monthly electrical conductivity readings if the following conditions have been met: (a) correlations between electrical conductivity and total dissolved solids or between electrical conductivity and another conservative mineral constituent have been established over a period of one year or more in make-up and blowdown water and (b) documentation of these correlations has been provided to the Director.*
- d. *For each large-scale steam electric power plant that is exempt from cycles of concentration requirements pursuant to section 6-1002, subsection C, paragraph 1, or for which an adjusted cycles of concentration requirement was granted pursuant to section 6-1002, subsection B or section 6-1002, subsection C, paragraph 2:*
- i. *The total quantity of blowdown water discharged from the cooling tower for each month or partial month when the facility was generating electricity during the calendar year.*
 - ii. *The total quantity of make-up water used at the cooling tower for each month or partial month when the facility was generating electricity during the calendar year.*
 - iii. *The weighted average concentration of total dissolved solids or other conservative mineral constituent in make-up water and blowdown water at the cooling tower for each month or partial month when the facility was generating electricity during the calendar year, either:*
 - 1) *Determined by direct analysis, or*
 - 2) *Calculated based on average monthly electrical conductivity readings if the following conditions have been met: (a) correlations between electrical conductivity and total dissolved solids or between electrical conductivity and another conservative mineral constituent have been established over a period of one year or more in make-up and blowdown water and (b) documentation of these correlations have been provided to the Director.*

- e. The amount of electricity generated each month or each partial month when the facility was generating electricity during the calendar year.*
- 2. All water measurements required in this section shall be made with a measuring device in accordance with ADWR's measuring device rules, A.A.C. R12-15-901, et. seq.*

B. Monitoring and Reporting Requirements for Combustion Turbine Electric Power Plants

For calendar year 2020, or the calendar year in which water use first commences, whichever is later, and for each calendar year thereafter until the first compliance date for any substitute monitoring and reporting requirement in the 5MP, an industrial user who uses groundwater at a large-scale electric power plant that is a combustion turbine electric power plant shall include in its annual reports required by A.R.S. § 45-632 the following information for all cooling towers with 250 tons or more of cooling capacity at the facility:

- 1. Capacity in tons of each cooling tower.*
- 2. For each cooling tower at the facility that is exempt from the requirements of 6-1003, subsection A pursuant to section 6-1003, subsection B, paragraph 2 or for which an alternative blowdown level has been granted, pursuant to section 6-1003, subsection B, paragraph 2, the percentage of water served to the cooling tower during the year that was reclaimed water.*
- 3. The quantity of water from any source, specified by source, that was used for make-up water on an annual basis during the calendar year as measured with a measuring device in accordance with ADWR's measuring device rules. A.A.C. R12-15-901, et seq.*
- 4. The quantity of water that was blown down on an annual basis during the calendar year as measured with a measuring device in accordance with ADWR's measuring device rules. A.A.C. R12-15-901, et seq.*
- 5. The average annual concentrations of silica, total hardness or other approved limiting constituent established under section 6-1003, subsection B, paragraph 2 or 3, in make-up and blowdown water during the calendar year, reported in mg/L or other measurement units established under section 6-1003, subsection B, paragraph 2 or 3, and either:*
 - a. Determined by direct analysis; or*
 - b. Calculated based on average monthly electrical conductivity readings for those portions of each month when cooling towers were fully operational if the following conditions have been met: (a) correlations between electrical conductivity and silica, between electrical conductivity and total hardness or between electrical conductivity and another approved limiting constituent established pursuant to section 6-2003 subsection B, paragraph 2 or 3, have been established over a period of one year or more in make-up and blowdown water; and (b) documentation of these correlations has been provided to the Director.*

6.11 INDUSTRIAL CONSERVATION REQUIREMENTS AND MONITORING AND REPORTING REQUIREMENTS FOR LARGE-SCALE COOLING FACILITIES

6-1101. Definitions

In addition to the definitions set forth in Chapters 1 and 2 of Title 45 of the Arizona Revised Statutes and section 6-601 of this chapter, unless the context otherwise requires, the following words and phrases used in section 6-1102 and 6-1103 shall have the following meanings:

- 1. “Blowdown water” means water discharged from a cooling tower recirculating water stream to control the buildup of minerals or other impurities in the recirculating water.*
- 2. “Conservative mineral constituent” means a component of recirculating water in a cooling tower, the concentration of which is not significantly modified by precipitation, loss to the atmosphere, or the addition of treatment chemicals.*
- 3. “Cycles of concentration” means the ratio of the concentration of a conservative mineral constituent or electrical conductivity in the blowdown water to the concentration of this same constituent or electrical conductivity in the make-up water.*
- 4. “Fully operational cooling tower” means a cooling tower that is functioning to dissipate heat.*
- 5. “Large-scale cooling facility” means a facility that has control over cooling operations with a total combined cooling capacity greater than or equal to 1,000 tons. For the purposes of this definition, the minimum cooling tower size that shall be used to determine total facility cooling capacity is 250 tons. A large-scale cooling facility does not include a large-scale power plant that utilizes cooling towers to dissipate heat.*
- 6. “Large-scale power plant” means an industrial facility that produces or is designed to produce more than 25 megawatts of electricity.*
- 7. “Limiting constituent” means a chemical, physical, or biological constituent present in recirculating cooling tower water that, due to potential physical or biological factors or due to potential exceedance of any federal, state, or local environmental standards upon discharge as blowdown, should not be allowed to accumulate in recirculating cooling tower water above a certain concentration.*
- 8. “Make-up water” means the water added back into the cooling tower recirculating water stream to replace water lost to evaporation, blowdown, or other mechanisms of water loss.*
- 9. “Reclaimed water-served cooling tower” means a cooling tower served by a make-up water supply that on an annual average basis consists of 50 percent or more reclaimed water.*

6-1102. Conservation Requirements

- A. Conservation Requirements for Large-Scale Cooling Facilities*

Beginning on January 1, 2020 or upon commencement of water use, whichever occurs later, and continuing thereafter until the first compliance date for any substitute conservation requirement in the 5MP, an industrial user who uses water at a large-scale cooling facility shall comply with the following requirement:

Each fully operational cooling tower with greater than or equal to 250 tons of cooling capacity at the facility shall achieve a cycles of concentration level that results in blowdown water being discharged at an average annual minimum of either 120 mg/l silica or 1,200 mg/l total hardness, whichever is reached first.

B. Exemptions and Alternative Blowdown Standards

- 1. The requirement set forth in subsection A of this section does not apply to a large-scale cooling facility in any year in which 100 percent of facility blowdown water is beneficially reused.*
- 2. The requirement set forth in subsection A of this section does not apply to any reclaimed water-served cooling tower at a large-scale cooling facility during the first 12 consecutive months in which more than 50 percent of the water supplied to the cooling tower is reclaimed water.*

After the 12-month period expires, the person using water at the reclaimed water-served cooling tower may apply to the Director to use an alternative blowdown level from that required in subsection A of this section if compliance with the blowdown requirement would not be possible due to the presence of a limiting constituent other than silica or total hardness in the reclaimed water supplying the cooling tower. To apply for an alternative blowdown level to address such a limiting constituent, an industrial user shall submit a request in writing to the Director that includes the following information:

- a. The limiting constituent other than silica or total hardness that is present in the reclaimed water supplying the tower which results in the need to blow down a greater annual volume of water than that required under subsection A of this section.*
- b. Documentation describing the concentration at which this limiting constituent should be blown down, and the reason for the alternative blowdown level.*

The Director shall grant the request if the Director determines that the presence of a limiting constituent other than silica or total hardness in the reclaimed water supplying the cooling tower results in the need to blow down a greater annual volume of water than that required under subsection A of this section. Any alternative blowdown level granted pursuant to this paragraph shall apply only while the tower qualifies as a reclaimed water-served cooling tower.

- 3. An industrial user may apply to the Director to use an alternative blowdown level from that required in subsection A of this section if compliance with the blowdown requirement would likely result in damage to cooling towers or associated equipment or exceedance of federal, state or local environmental discharge standards because of the accumulation of a limiting constituent other than silica or total hardness in recirculating water. To apply for an alternative blowdown level for such a limiting constituent, an industrial user shall submit a request in writing to the Director that includes the following information:*

- a. *Historic, current, and projected water quality data for the relevant limiting constituent(s).*
- b. *Documentation describing the potential damage to cooling towers or associated equipment, or documentation of environmental standards that are likely to be exceeded, whichever applies.*

The Director shall grant the request if the Director determines that compliance with the blowdown level set forth in subsection A of this section would likely result in damage to cooling towers or associated equipment or exceedance of federal, state, or local environmental discharge standards because of the accumulation of a limiting constituent other than silica or total hardness in recirculating water.

6-1103. Monitoring and Reporting Requirements

For calendar year 2020 or the calendar year in which water use first commences, whichever is later, and for each calendar year thereafter until the first compliance date for any substitute monitoring and reporting requirement in the 5MP, an industrial user who uses water at a large-scale cooling facility shall include in its annual report required by A.R.S. § 45-632 the following information for all cooling towers with 250 tons or more of cooling capacity at the facility:

1. *Capacity in tons of each cooling tower.*
2. *Number of days per month that each cooling tower was fully operational.*
3. *For each cooling tower at the facility that is exempt from cycles of concentration requirements under section 6-1102, subsection B, paragraph 2 or for which an alternative blowdown level has been granted, pursuant to section 6-1102, subsection B, paragraph 2, the percentage of water served to the tower during the year that was reclaimed water.*
4. *The quantity of water from any source, specified by source, that was used for make-up water on a monthly basis during the calendar year as measured with a measuring device in accordance with ADWR's measuring device rules, A.A.C. R12-15-901, et seq.*
5. *The quantity of water that was blown down on a monthly basis during the calendar year as measured with a measuring device in accordance with ADWR's measuring device rules, A.A.C. R12-15-901, et seq.*
6. *The average monthly concentrations of silica, total hardness or other approved limiting constituent established under section 6-1102 subsection B, paragraph 2 or 3, in make-up and blowdown water for those portions of each month when cooling towers were fully operational during the calendar year, reported in mg/l or other measurement units established under section 6-1102, subsection B, paragraph 2 or 3, and either:*
 - a. *Determined by direct analysis; or*
 - b. *Calculated based on average monthly electrical conductivity readings for those portions of each month when cooling towers were fully operational if the following*

conditions have been met: (a) correlations between electrical conductivity and silica, between electrical conductivity and total hardness, or between electrical conductivity and another approved limiting constituent established pursuant to section 6-1102 subsection B, paragraph 2 or 3, have been established over a period of one year or more in make-up and blowdown water; and (b) documentation of these correlations has been provided to the Director.

6.12 INDUSTRIAL CONSERVATION REQUIREMENTS AND MONITORING AND REPORTING REQUIREMENTS FOR DAIRY OPERATIONS

6-1201. Definitions

In addition to the definitions set forth in Chapters 1 and 2 of Title 45 of the Arizona Revised Statutes, unless the context otherwise requires, the following words and phrases used in sections 6-1202 through 6-1205 of this chapter shall have the following meanings:

- 1. "Dairy animal" means a lactating cow or a non-lactating animal present at a dairy operation.*
- 2. "Dairy operation" means a facility that houses an average of 100 or more lactating cows per day during a calendar year as calculated in section 6-1202.*
- 3. "Dairy wastewater" means any water that has been put to a beneficial use at the dairy operation, including water containing dairy animal wastes.*
- 4. "Lactating cow" means any cow that is producing milk that is present on-site at a dairy operation and receives water through the dairy operation's watering system.*
- 5. "Non-lactating animal" means a calf, heifer, mature dry cow, bull, or steer that is present on-site at a dairy operation and receives water through the dairy operation's watering system.*

6-1202. Maximum Annual Water Allotment Conservation Requirements

A. Maximum Annual Water Allotment

Beginning on January 1, 2020 or upon commencement of water use, whichever is later, and continuing thereafter until the first compliance date for any substitute conservation requirement in the 5MP, an industrial user shall not withdraw, divert, or receive water for use at a dairy operation during a calendar year in a total amount that exceeds the dairy operation's maximum annual water allotment for the year as calculated in subsection B below, unless the industrial user applies for and is accepted into the Best Management Practices Program (BMP Program) described below in section 6-1204.

B. Calculation of Maximum Annual Water Allotment

A dairy operation's maximum annual water allotment for a calendar year shall be determined as follows:

1. Calculate the average daily number of lactating cows and non-lactating animals that are present during the calendar year. The average daily number of lactating cows and non-lactating animals present during the calendar year shall be calculated as follows:
 - a. Determine the total number of lactating cows and non-lactating animals present at the dairy operation on the last day of each month during the calendar year.
 - b. For each category of animal, add together the total number of such animals present at the dairy operation on the last day of each month during the year in question, and then divide the result by 12. The quotient is the average daily number of lactating cows and non-lactating animals present during the calendar year.
2. Calculate the dairy operation's maximum annual water allotment for the calendar year as follows:
 - a. Multiply the average daily number of lactating cows present during the calendar year by 105 gallons per animal per day (GAD) and then convert to ac-ft per year as follows:

$$C_L \times \frac{105 \text{ GAD}}{325,851 \text{ g/af}} \times d/\text{yr} = \text{Maximum annual water allotment for lactating cows (ac-ft per year)}$$

Where: C_L = Average daily number of lactating cows

GAD = Gallons per animal per day

g/af = Gallons per acre-foot

d/yr = Days in the year

The result is the dairy operation's maximum annual water allotment for lactating cows for the calendar year.

- b. Multiply the average daily number of non-lactating animals present during the calendar year by 20 gallons per animal per day (GAD) and then convert to ac-ft per year as follows:

$$A_N \times \frac{20 \text{ GAD}}{325,851 \text{ g/af}} \times d/\text{yr} = \text{Maximum annual water allotment for non-lactating animals (ac-ft per year)}$$

Where: A_N = Average daily number of non-lactating animals

GAD = Gallons per animal per day

g/af = Gallons per acre-foot

d/yr = Days per year

The result is the dairy operation's maximum annual water allotment for non-lactating animals for the calendar year.

- c. Add the dairy operation's maximum annual water allotment for non-lactating animals for the calendar year as calculated in subparagraph b of this paragraph and the dairy operation's maximum annual water allotment for lactating cows for the calendar year as calculated in subparagraph a of this paragraph. The sum is the maximum annual

water allotment for the dairy operation for the calendar year, except as provided in subparagraph d of this paragraph.

- d. Upon application, the Director may approve an additional allocation of water for the dairy operation consistent with industry health and sanitation objectives if the dairy operation requires more than its maximum annual water allotment because of one or more of the following:*
 - 1. milkings per lactating cow occur more than three times daily,*
 - 2. technologies are used to achieve industry health and sanitation objectives that require additional water use or,*
 - 3. technologies are designed and/or implemented for cooling lactating cows and non-lactating animals that increase milk production.*
- 3. Nothing in this section shall be construed to authorize a person to use more water from any source than the person is entitled to use pursuant to a groundwater or appropriable water right or permit held by the person. Nor shall this section be construed to authorize a person to use water from any source in a manner that violates Chapter 1 or Chapter 2 of Title 45, Arizona Revised Statutes.*

6-1203. Compliance with Maximum Annual Water Allotment

An industrial user who uses water at a dairy operation is in compliance for a calendar year with the dairy operation's maximum annual water allotment if the Director determines that either of the following applies:

- 1. The volume of water withdrawn, diverted, or received during the calendar year for use at the dairy operation, less the volume of dairy wastewater delivered from the dairy operation to the holder of a grandfathered groundwater right for a beneficial use, is equal to or less than the dairy operation's maximum annual water allotment for the calendar year; or*
- 2. The three-year average volume of water withdrawn, diverted, or received for use at the dairy operation during that calendar year and the preceding two calendar years is equal to or less than the dairy operation's three-year average maximum annual water allotment for that calendar year and the preceding two calendar years. In calculating the three-year average volume of water withdrawn, diverted, or received for use at the dairy operation, the volume of dairy wastewater delivered from the dairy operation to the holder of a grandfathered right for a beneficial use shall not be counted.*

6-1204. Best Management Practices Program Conservation Requirements

A. Criteria for Approval of Application

An industrial user who uses water at a dairy operation may apply for regulation under the Best Management Practices Program (BMP Program) by submitting an application on a form provided by the Director. The Director shall approve a complete and correct application for regulation under the BMP Program if the Director determines that the applicant will implement all of the standard best management practices (BMPs) described in Appendix 6B,

unless the Director approves a substitution of a standard BMP under subsection D of this section or a waiver of a standard BMP under subsection E of this section. If the Director approves a substitution of a standard BMP, the Director shall approve the application if the Director determines that the applicant will implement the substitute BMP or BMPs in addition to any remaining standard BMPs.

B. Exemption from Maximum Annual Water Allotment Conservation Requirements

An industrial user accepted for regulation under the BMP Program is exempt from the maximum annual water allotment conservation requirements set forth in section 6-1202 beginning on January 1 of the first calendar year after the industrial user's application for the BMP Program is approved, unless the Director approves an earlier date.

C. Compliance with Best Management Practices Program

Beginning on a date established by the Director and continuing thereafter until the first compliance date for any substitute conservation requirement established in the 5MP, an industrial user accepted for regulation under the BMP Program shall comply with all standard BMPs listed in Appendix 6B, unless the Director approves a substitution of a standard BMP under subsection D of this section, or a waiver of a standard BMP under subsection E of this section. If the Director approves a substitution of a standard BMP, the industrial user shall comply with the substitute BMP or BMPs in addition to any remaining standard BMPs. The standard BMPs listed in Appendix 6B are broken into the following seven categories: (1) delivery of drinking water for dairy animals; (2) udder washing and milking parlor cleaning; (3) corral design and maintenance; (4) cleaning and sanitizing milking equipment; (5) dust control, calf housing cleaning, and feed apron flushing; (6) dairy animal cooling; and (7) dairy animal feed preparation.

D. Substitution of Best Management Practices

- 1. The Director may allow an industrial user applying for the BMP Program to replace a standard BMP listed in Appendix 6B with a substitute BMP if the Director determines that the standard BMP cannot be achieved and that implementation of the substitute BMP will result in water use efficiency equivalent to that of the standard BMP. To apply for a substitution of a standard BMP, the industrial user shall include in its application for the BMP Program an explanation of why the standard BMP is not achievable and a description of how the substitute BMP will result in water use efficiency equivalent to that of the standard BMP.*
- 2. An industrial user regulated under the BMP Program may apply to the Director for a substitution of an existing BMP that is no longer appropriate for the industrial user's dairy operation. The Director may allow the industrial user to replace the existing BMP with a substitute BMP if the Director determines that the substitute BMP will result in water use efficiency equivalent to that of the existing BMP.*

E. Waiver of Best Management Practices

- 1. The Director may waive a standard BMP listed in paragraph 3 of this subsection if the Director determines that the standard BMP cannot be achieved and that no substitute BMP is appropriate. To apply for a waiver of a standard BMP listed in paragraph 3, the*

industrial user shall include in its application for the BMP Program an explanation of why the standard BMP is not achievable and why no substitute BMP is appropriate.

- 2. An industrial user regulated under the BMP Program may apply to the Director for a waiver of an existing BMP listed in paragraph 3 of this subsection if the BMP is no longer appropriate for the industrial user's dairy operation. The Director may waive the existing BMP if the Director determines that the existing BMP is no longer appropriate for the industrial user's dairy operation and that no substitute BMP is appropriate.*
- 3. Only the following standard BMPs may be waived by the Director under this subsection: (1) BMP 2.1.2 (Udder Wash System); (2) BMP 2.2.2 (Milking Parlor Floor and Wall Washing); (3) BMP 4.1.1 (Milk Cooling and Vacuum Pump); (4) all of the standard BMPs in Water Use Category No. 5 (Dust Control, Calf Housing Cleaning, and Feed Apron Flushing); (5) all of the standard BMPs in Water Use Category No. 6 (Dairy Animal Cooling); and (6) all of the standard BMPs in Water Use Category No. 7 (Dairy Animal Feed Preparation).*

F. Five Year Review of Best Management Practices

Five years after an industrial user is accepted for regulation under the BMP Program, the Director shall review the industrial user's BMPs to determine whether any changes in the BMPs are warranted. If the Director determines that any of the existing BMPs are no longer appropriate due to an expansion of the dairy operation or a change in management practices at the operation, the Director shall notify the industrial user in writing of that determination and the Director and the industrial user shall make a good faith effort to stipulate to a modification of the BMPs so that they are appropriate for the expanded operation or the change in management practices.

If the Director and the industrial user are unable to stipulate to a modification to the BMPs within 180 days after the Director notifies the industrial user of the determination that one or more of the existing BMPs are no longer appropriate or such longer time as the Director may agree to, the industrial user shall no longer be regulated under the BMP Program but shall thereafter be required to comply with the maximum annual water allotment conservation requirements set forth in section 6-1202.

If the Director and the industrial user stipulate to a modification of the BMPs, the industrial user shall comply with the modified BMPs by a date agreed upon by the Director and the industrial user and shall continue complying with the modified BMPs until the first compliance date for any substitute conservation requirement in the 5MP.

G. Change in Ownership of Dairy Operation

- 1. If an industrial user regulated under the BMP Program sells or conveys the dairy operation to which the BMPs apply, the new owner of the dairy operation shall continue to be regulated under the BMP Program until January 1 of the first calendar year after acquiring ownership of the dairy operation. Except as provided in paragraph 2 of this section, beginning on January 1 of the first calendar year after acquiring ownership of the dairy operation, the new owner shall comply with the maximum annual water allotment conservation requirements set forth in section 6-1202. The new owner may at any time apply for regulation under the BMP Program.*

2. *If the new owner submits a complete and correct application for regulation under the BMP Program prior to January 1 of the first calendar year after acquiring ownership of the dairy operation, the new owner shall continue to be regulated under the BMP Program until the Director makes a determination on the application. If the Director denies the application, the new owner shall be required to comply with the maximum annual water allotment conservation requirements set forth in section 6-1202 immediately upon notification of the denial or January 1 of the first calendar year after acquiring ownership of the dairy, whichever is later. If the Director approves the application, the new owner shall continue to be regulated under the BMP Program until the first compliance date for any substitute conservation requirement in the 5MP.*

6-1205. Monitoring and Reporting Requirements

For the calendar year 2020 or the calendar year in which water use is commenced at the dairy operation, whichever occurs later, and for each calendar year thereafter until the first compliance date for any substitute monitoring and reporting requirements in the 5MP, an industrial user who uses water at a dairy operation shall include the following information in its annual report required by A.R.S. § 45-632:

1. *The total quantity of water from any source, including reclaimed water, withdrawn, diverted, or received during the calendar year for use by the dairy operation, as measured with a measuring device in accordance with ADWR's measuring device rules, A.A.C. R12-15-901, et seq.*
2. *The total quantity of water delivered during the calendar year to any uses other than the dairy operation from the well or wells that serve the dairy operation, as measured with a measuring device in accordance with ADWR's measuring device rules, A.A.C. R12-15-901, et seq.*
3. *The total quantity of dairy wastewater delivered to grandfathered rights other than the dairy operation, as measured with a measuring device in accordance with ADWR's measuring device rules, A.A.C. R-12-15-901, et seq.*
4. *The total number of lactating cows and non-lactating animals that were present on-site at the dairy operation on the last day of each month during the calendar year.*
5. *If the dairy operation is regulated under the BMP Program, any documentation as required by the Director that demonstrates compliance with the program.*

6.13 INDUSTRIAL CONSERVATION REQUIREMENTS AND MONITORING AND REPORTING REQUIREMENTS FOR CATTLE FEEDLOT OPERATIONS

6-1301. Definitions

In addition to the definitions set forth in Chapters 1 and 2 of Title 45 of the Arizona Revised Statutes, unless the context otherwise requires, the following words and phrases used in sections 6-1302 through 6-1303 of this chapter, shall have the following meanings:

1. *"Beef cattle" means cattle or calves fed primarily for meat production.*

2. "Cattle feedlot operation" means a facility that houses and feeds an average of 100 or more beef cattle per day during a calendar year as calculated in section 6-1302.

6-1302. Maximum Annual Water Allotment Conservation Requirements

A. Maximum Annual Water Allotment

Beginning on January 1, 2020 or upon commencement of water use, whichever is later, and continuing thereafter until the first compliance date for any substitute conservation requirement in the 5MP, an industrial user shall not withdraw, divert, or receive water for use at a cattle feedlot operation during a calendar year in a total amount that exceeds the cattle feedlot's maximum annual water allotment for the year as calculated in subsection B below.

B. Calculation of Maximum Annual Water Allotment

A cattle feedlot operation's maximum annual water allotment for a calendar year shall be determined as follows:

1. *Calculate the average daily number of beef cattle present during the calendar year. The Director shall calculate the average daily number of beef cattle present during the calendar year as follows:*
 - a. *Determine the total number of beef cattle present at the cattle feedlot operation on the last day of each month during the calendar year.*
 - b. *Add together the total number of beef cattle present at the cattle feedlot operation on the last day of each month during the year in question and then divide the result by 12. The quotient is the average daily number of beef cattle present at the cattle feedlot operation during the calendar year.*
2. *Multiply the average daily number of beef cattle present at the cattle feedlot operation during the calendar year by a water allotment of 30 gallons per animal per day (GAD) and then convert to ac-ft per year as follows:*

$$C_B \times \frac{30 \text{ GAD}}{325,851 \text{ g/acre-foot}} \times d/\text{yr} = \text{Maximum annual water allotment for the cattle feedlot operation (acre-feet/year)}$$

Where: C_B = Average daily number of beef cattle
 GAD = Gallons per animal per day
 g/acre-foot = Gallons per acre-foot
 d/yr = Days in the year

C. Compliance with Maximum Annual Water Allotment

An industrial user who uses water at a cattle feedlot operation is in compliance for a calendar year with the cattle feedlot operation's maximum annual water allotment if the Director determines that either of the following applies:

1. *The volume of water withdrawn, diverted, or received during the calendar year for use at the cattle feedlot operation is equal to or less than the cattle feedlot operation's maximum annual water allotment for the calendar year; or*
 2. *The three-year average volume of water withdrawn, diverted, or received for use at the cattle feedlot operation during that calendar year and the preceding two calendar years is equal to or less than the cattle feedlot operation's three-year average maximum annual water allotment for that calendar year and the preceding two calendar years.*
- D. *Nothing in this section shall be construed to authorize a person to use more water from any source than the person is entitled to use pursuant to a groundwater or appropriable water right or permit held by the person. Nor shall this section be construed to authorize a person to use water from any source, including reclaimed water, in a manner that violates Chapter 1 or Chapter 2 of Title 45, Arizona Revised Statutes.*

6-1303. Monitoring and Reporting Requirements

For calendar year 9 or the calendar year in which water use is first commenced at the cattle feedlot operation, whichever occurs later, and for each calendar year thereafter until the first compliance date for any substitute monitoring and reporting requirements in the 5MP, an industrial user who uses water at a cattle feedlot operation shall include the following information in its annual report required by A.R.S. § 45-632:

1. *The total quantity of water from any source, including reclaimed water, withdrawn, diverted, or received during the calendar year for use at the cattle feedlot operation as measured with a measuring device in accordance with ADWR's measuring device rules, A.A.C. R12-15-901, et seq.*
2. *The total number of beef cattle which were present on-site at the cattle feedlot operation on the last day of each month during the calendar year.*

6.14 INDUSTRIAL CONSERVATION REQUIREMENTS AND MONITORING AND REPORTING REQUIREMENTS FOR NEW LARGE LANDSCAPE USERS

6-1401. Definitions

In addition to the definitions set forth in Chapters 1 and 2 of Title 45 of the Arizona Revised Statutes and section 6-601 of this chapter, unless the context otherwise requires, the following words and phrases used in sections 6-1402 and 6-1403 of this chapter shall have the following meanings:

1. *"Direct use reclaimed water" means reclaimed water transported directly from a facility regulated pursuant to Title 49, Chapter 2, Arizona Revised Statutes, to an end user. Direct use reclaimed water does not include reclaimed water that has been stored pursuant to Title 45, Chapter 3.1, Arizona Revised Statutes.*
2. *"Landscapable area" means the entire area of a lot less any areas covered by structures, parking lots, roads, or any other area not physically capable of being landscaped.*
3. *"New large landscape user" means a non-residential facility that has a water-intensive*

landscaped area in excess of 10,000 square feet and that has landscaping planted and maintained after January 1, 1990 or bodies of water, other than bodies of water used primarily for swimming purposes, filled and maintained after January 1, 1990, or both. The following facilities are excluded from this definition: schools, parks, cemeteries, golf courses, common areas of housing developments and public recreational facilities.

4. *“Reclaimed water recovered within the area of impact” means reclaimed water that has been stored pursuant to Title 45, Chapter 3.1, Arizona Revised Statutes, and recovered within the area of impact of storage. For the purposes of this definition, “area of impact” has the same meaning as prescribed by A.R.S. § 45-802.01.*
5. *“Water-intensive landscaped area” means, for the calendar year in question, all of the following areas within a non-residential facility:*
 - a. *Any area of land that is planted primarily with plants not listed in ADWR’s Low Water Use/Drought Tolerant Plant List for PAMA and watered with a permanent water application system, except any area of land that is watered exclusively with direct use reclaimed water or reclaimed water recovered within the area of impact.*
 - b. *The total water surface area of all bodies of water within the facility, except bodies of water used primarily for swimming purposes, bodies of water filled and refilled exclusively with direct use reclaimed water or reclaimed water recovered within the area of impact, and bodies of water allowed under an interim water use permit pursuant to A.R.S. § 45-133 if the bodies of water will be filled and refilled exclusively with direct use reclaimed water or reclaimed water recovered within the area of impact after the permit expires.*

6-1402. Conservation Requirements

A. Conservation Requirements for New Large Landscape Users that are not Hotels or Motels

Beginning on January 1, 2020 and continuing thereafter until the first compliance date for any substitute conservation requirement in the 5MP, the water-intensive landscaped area within a new large landscape user that is not a hotel or motel shall not exceed the greater of the following: (1) an area calculated by adding 10,000 square feet plus 20 percent of the facility’s landscapable area in excess of 10,000 square feet; or (2) the total water surface area of all bodies of water within the facility that are allowed under A.R.S. § 45-131 et seq., and that qualify as water-intensive landscaped area.

B. Conservation Requirements for New Large Landscape Users that are Hotels or Motels

Beginning on January 1, 2020 and continuing thereafter until the first compliance date for any substitute conservation requirement in the 5MP, the water-intensive landscaped area within a new large landscape user that is a hotel or motel shall not exceed the greater of the following: (1) an area calculated by adding 20,000 square feet plus 20 percent of the facility’s landscapable area in excess of 20,000 square feet; or (2) the total water surface area of all bodies of water within the facility that are allowed under A.R.S. § 45-131 et seq, and that qualify as water-intensive landscaped area.

C. Waiver of Conservation Requirements for the Use of 100 Percent Wastewater

The conservation requirements set forth in subsections A and B of this section shall not apply to a new large landscape user in any year in which all of the water used for landscaping purposes within the facility is wastewater.

6-1403. Monitoring and Reporting Requirements

For calendar year 2020, or the calendar year in which the facility first begins to use water, whichever is later, and for each calendar year thereafter until the first compliance date for any substitute monitoring and reporting requirement in the 5MP, an industrial user that applies water to a new large landscape user shall include the following information in its annual report required by A.R.S. § 45-632:

- 1. The total quantity of water from any source, including reclaimed water, withdrawn, diverted, or received for use on the facility during the calendar year for landscape watering purposes, including bodies of water filled or refilled during the calendar year, as measured with a measuring device in accordance with ADWR's measuring device rules. A.A.C. R12-15-901, et seq.*
- 2. The total amount of landscapable area within the facility.*
- 3. The total amount of water-intensive landscaped area at the facility broken down into the area planted primarily with plants not listed in ADWR's Low Water Use/Drought Tolerant Plant List for PAMA (except any area watered exclusively with direct use reclaimed water or reclaimed water recovered within the area of impact) and the surface area of all bodies of water (except bodies of water used primarily for swimming purposes, bodies of water filled and refilled exclusively with direct use reclaimed water or reclaimed water recovered within the area of impact, and bodies of water allowed under an interim water use permit if the bodies of water will be filled and refilled exclusively with direct use reclaimed water or reclaimed water recovered within the area of impact after the permit expires).*

6.15 INDUSTRIAL CONSERVATION REQUIREMENTS AND MONITORING AND REPORTING REQUIREMENTS FOR NEW LARGE INDUSTRIAL USERS

6-1501. Definitions

In addition to the definitions set forth in Chapters 1 and 2 of Title 45 of the Arizona Revised Statutes and section 6-601 of this chapter, "new large industrial user" as used in section 6-1502 shall mean an industrial user that begins using more than 100 ac-ft of water per year for industrial purposes after January 1, 2020.

6-1502 Conservation Requirements

- A. Not later than 180 days after receiving notice of these conservation requirements, or within 180 days after the end of the first calendar year in which the facility first uses more than 100 ac-ft of water for industrial purposes, whichever is later, a new large industrial user shall submit to the Director a plan to improve the efficiency of water use by the facility. The plan shall:*

1. *Specify the level of water conservation that can be achieved assuming the use of the latest commercially available technology consistent with reasonable economic return;*
 2. *Identify water uses and conservation opportunities within the facility, addressing water used for the following categories as appropriate: landscaping; space cooling; process-related water use, including recycling; and sanitary and kitchen uses;*
 3. *Describe an ongoing water conservation education program for employees; and*
 4. *Include an implementation schedule.*
- B. *If a person required to submit a plan under subsection A of this section is required to submit a conservation plan under another section of this chapter, the person may combine the plans into a single conservation plan.*

**APPENDIX 6A
TURF-RELATED FACILITIES**

Facility Name	Water Source	Water Supply	Right Number
SCHOOLS			
CASA GRANDE MIDDLE SCHOOL	ARIZONA WATER CO - PINAL VALLEY SYSTEM	Groundwater, Recovered CAP	56-001307.0001
CASA GRANDE UNION HIGH SCHOOL	ARIZONA WATER CO - PINAL VALLEY SYSTEM	Groundwater, Recovered CAP	56-001307.0001
CHOLLA ELEMENTARY SCHOOL	ARIZONA WATER CO - PINAL VALLEY SYSTEM	Groundwater, Recovered CAP	56-001307.0001
COOLIDGE CENTRAL & HIGH SCHOOL	ARIZONA WATER CO - PINAL VALLEY SYSTEM, SAN CARLOS IRRIGATION & DRAINAGE DISTRICT	Groundwater, Recovered CAP, Reclaimed water, Surface water	56-001307.0001, 57-001104.0000
COOLIDGE WEST ELEM. SCHOOL	SAN CARLOS IRRIGATION & DRAINAGE DISTRICT, ARIZONA WATER CO - PINAL VALLEY SYSTEM	Groundwater, Recovered CAP	57-001104.0000, 56-001307.0001
COTTONWOOD ELEMENTARY SCHOOL	ARIZONA WATER CO - PINAL VALLEY SYSTEM	Groundwater, Recovered CAP	56-001307.0001
ELOY JUNIOR HIGH SCHOOL	CITY OF ELOY	Groundwater	56-001203.0000
EVERGREEN ELEMENTARY SCHOOL	ARIZONA WATER CO - PINAL VALLEY SYSTEM	Groundwater, Recovered CAP	56-001307.0001
FLORENCE HIGH SCHOOL	TOWN OF FLORENCE	Commingled water, Groundwater	56-001204.0001, 57-001104.0000
FLORENCE K-8	TOWN OF FLORENCE, SAN CARLOS IRRIGATION & DRAINAGE DISTRICT	Effluent, Groundwater, Normal Flow	56-001204.0001, 57-001104.0000
MARICOPA UNIFIED SCHOOL DIST #20	GLOBAL WATER - SANTA CRUZ WATER COMPANY	Groundwater	56-001355.0000
MARICOPA UNIFIED SCHOOLS	TYPE 2 NON-IRRIGATION GFR	Groundwater	58-107972.0000
SANTA CRUZ VALLEY UNION HIGH	TYPE 2 NON-IRRIGATION GFR	Groundwater	58-102469.0000
VISTA GRANDE HIGH SCHOOL	ARIZONA WATER CO - PINAL VALLEY SYSTEM	Groundwater, Recovered CAP	56-001307.0001
PARKS			
CITY OF CASA GRANDE-CARR MCNATT PARK	ARIZONA WATER CO - PINAL VALLEY SYSTEM	Groundwater, Recovered CAP	56-001307.0001
COPPER SKY SPORTS COMPLEX	GLOBAL WATER - SANTA CRUZ WATER COMPANY	Became active in 2016; 2017 will be first year reporting	56-001355.0000
GRANDE SPORTS WORLD	ARIZONA WATER CO - PINAL VALLEY SYSTEM	UNTREATED CAP	56-001307.0001
PACANA PARK	GLOBAL WATER - SANTA CRUZ WATER COMPANY	Groundwater, Effluent	56-001355.0000
PAUL MANSON SPORTS COMPLEX	As built request made 4/22/16	As built request made 4/22/16	As built request made 4/22/16
COMMON AREAS			
ALTERRA HOA	GLOBAL WATER - SANTA CRUZ WATER COMPANY	Became active in 2016; 2017 will be first year reporting	56-001355.0000
ANTHEM AT MERRIL RANCH	TYPE 1 NON-IRRIGATION GFR, JOHNSON UTILITIES - PINAL	Groundwater, Effluent	56-001538.0000, 58- 105083.0006
ARROYO VISTA HOA	Pending application	Pending application	Pending application
CASA GRANDE LAKES COMMUNITY ASSOCIATION	TYPE 1 NON-IRRIGATION GFR	Groundwater	58-112521.0006
COBBLESTONE FARMS HOA	GLOBAL WATER - SANTA CRUZ WATER COMPANY	Effluent	56-001355.0000

**APPENDIX 6A
TURF-RELATED FACILITIES**

DESERT PASSAGE HOA	GLOBAL WATER - SANTA CRUZ WATER COMPANY	Became active in 2016; 2017 will be first year reporting	56-001355.0000
GLENNWILDE GROVES HOA	GLOBAL WATER - SANTA CRUZ WATER COMPANY	Groundwater, Effluent	56-001355.0000
HEARTLAND COOLIDGE HOA	ARIZONA WATER CO - PINAL VALLEY SYSTEM	Became active in 2016; 2017 will be first year reporting	56-001307.0001
HOMESTEAD NORTH & TRADITIONS AT HOMESTEAD NORTH HOA	GLOBAL WATER - SANTA CRUZ WATER COMPANY	Zero use reported since facility became active in 2007.	56-001355.0000
HOMESTEAD NORTH HOA	GLOBAL WATER - SANTA CRUZ WATER COMPANY	Groundwater, Effluent	56-001355.0000
MARICOPA MEADOWS HOA	GLOBAL WATER - SANTA CRUZ WATER COMPANY	Groundwater, Effluent	56-001355.0000
PARADISE LAKE ASSOCIATION	TYPE 2 NON-IRRIGATION GFR	Groundwater	58-117253.0004
PROVINCE COMMUNITY HOA	GLOBAL WATER - SANTA CRUZ WATER COMPANY	Groundwater, Effluent	56-001355.0000
RANCHO EL DORADO MAIN LAKE	GLOBAL WATER - SANTA CRUZ WATER COMPANY	Groundwater	56-001355.0000
RANCHO EL DORADO PHASE III HOA		Waiting on As-Built	
RANCHO MIRAGE MASTER PLANNED HOA	GLOBAL WATER - SANTA CRUZ WATER COMPANY	Effluent	56-001355.0000
RANCHO MIRAGE PHASE II	GLOBAL WATER - SANTA CRUZ WATER COMPANY	No water use since 2008	56-001355.0000
SENITA COMMUNITY ASSOCIATION	GLOBAL WATER - SANTA CRUZ WATER COMPANY	Allotment letter and conservation request sent 1/19	56-001355.0000
SORRENTO COMMUNITY MASTER ASSOCIATION	GLOBAL WATER - SANTA CRUZ WATER COMPANY	Effluent	56-001355.0000
THE LAKES AT RANCHO EL DORADO	GLOBAL WATER - SANTA CRUZ WATER COMPANY	Effluent	56-001355.0000
THE VILLAGES AT RANCHO EL DORADO HOA	GLOBAL WATER - SANTA CRUZ WATER COMPANY	Groundwater, Effluent	56-001355.0000
TORTOSA HOA	TYPE 1 NON-IRRIGATION GFR	Groundwater	58-111941.0027, 58-111941.0026
VILLAGO HOA	TYPE 1 NON-IRRIGATION GFR	Groundwater	58-100307.0014
VILLAGO LAKES AND PARK	TYPE 1 NON-IRRIGATION GFR	Groundwater	58-100307.0009
GOLF COURSES			
ARIZONA CITY GOLF COURSE	ARIZONA WATER CO - PINAL VALLEY SYSTEM	Effluent	56-001307.0001
DAVE WHITE MUNICIPAL GOLF COURSE	CITY OF CASA GRANDE	Effluent	56-001356.0001
DUKE AT RANCHO EL DORADO	GLOBAL WATER - SANTA CRUZ WATER COMPANY	Groundwater	56-001355.0000
FRANCISCO GRANDE GOLF CLUB	ARIZONA WATER CO - PINAL VALLEY SYSTEM	CAP, Effluent	56-001307.0001
MISSION ROYAL GOLF CLUB	TYPE 1 NON-IRRIGATION GFR	Groundwater	58-102330.0035
PALM CREEK GOLF COURSE	TYPE 1 NON-IRRIGATION GFR	Groundwater	58-108135.0014
POSTON BUTTE GOLF CLUB	JOHNSON UTILITIES - PINAL, TYPE 1 NON-IRRIGATION GFR	Groundwater, Effluent	56-001538.0000, 58-105083.0006
RMK DEVELOPMENT (TIERRA GRANDE)	TYPE 1 NON-IRRIGATION GFR	Groundwater, Effluent	58-100410.0006, 58-100410.0005
ROBSON RANCH GOLF COURSE	PICACHO WATER COMPANY	Groundwater, Effluent	56-001353.0000
SAN MIGUEL GOLF COURSE	CITY OF ELOY	CAP	56-001203.0000
THREE PARKS FAIRWAYS	TOWN OF FLORENCE	Groundwater, Effluent	56-001204.0001

APPENDIX 6B
DAIRY OPERATION BEST MANAGEMENT PRACTICES PROGRAM
STANDARD BEST MANAGEMENT PRACTICES

WATER USE CATEGORY 1. DELIVERY OF DRINKING WATER FOR DAIRY ANIMALS

Description: The level of milk production, season of year and type of dairy animal housing has a significant effect on the water intake of a dairy animal. The drinking water needs of a lactating cow will vary from 25 to 45 gallons per day. As milk production per cow per day increases, drinking water intake will also increase. Conservation of dairy animal drinking water could best be accomplished by preventing and promptly repairing leaks in the drinking water system.

BMP 1.1

Install and maintain valves and floats throughout the drinking water system to allow for the isolation of leaks in lines and tanks.

The Annual Report required by A.R.S. § 45-632 shall include a water system map of the dairy facility showing the location of all valves and floats. This map shall be submitted one time only (the first annual report following acceptance into the BMP Program) unless there is a change in the location of the valves or floats.

BMP 1.2

Inspect the drinking water system for leaks daily to ensure that leaks are promptly identified and repaired to prevent water loss. If a leak occurs, stop water flow by isolating the area of the leak and/or repair the leak within 72 hours.

WATER USE CATEGORY 2. UDDER WASHING AND MILKING PARLOR CLEANING

Description: Udder washing and milking parlor cleaning is the single largest water use at a dairy operation. Floor and wall wash and sanitation of the milking area is necessary for producing a safe product. These systems can be either manual or semi-automatic. The amount of water used also depends on weather conditions. Udder washing and milking parlor cleaning offer the greatest conservation potential at a dairy through management of the system.

2.1 UDDER WASH SYSTEM

BMP 2.1.1

Install and operate the udder washing system with automatic timers. When udder washing, use a maximum of one minute of water for the soak cycle followed by a minimum of two minutes off and a maximum of three minutes of water for the wash cycle followed by one minute off. Repeat with a second wash cycle if needed.

APPENDIX 6B
DAIRY OPERATION BEST MANAGEMENT PRACTICES PROGRAM
STANDARD BEST MANAGEMENT PRACTICES

BMP 2.1.2

Install a grid no larger than six feet by five feet between sprinkler heads on wash pens installed or renovated after January 1, 2002.

The Annual Report required by A.R.S. § 45-632 shall include a water system map of the dairy facility showing the location of all sprinkler heads and the dimensions of the wash pens. This map shall be submitted one time only (the first annual report following acceptance into the BMP Program) unless there is a change to the location of the sprinkler heads or to the dimensions of the wash pens.

BMP 2.1.3

Install lock-out devices so that the wash system can be used only once per group of cows unless exceptional conditions require an override of the lock-out device.

The Annual Report required by A.R.S. § 45-632 shall include a water system map of the dairy facility showing the location of all lock-out devices. This map shall be submitted one time only (the first annual report following acceptance into the BMP Program) unless there is a change to the location of the lock-out devices.

BMP 2.1.4

Establish and implement an inspection schedule to properly maintain and replace spray heads and timing devices. Inspect all spray heads and timing devices daily to ensure that they are operating correctly. If a device is found to be malfunctioning, repair or replace the device within 72 hours.

2.2 MILKING PARLOR FLOOR AND WALL WASHING

BMP 2.2.1

Equip all parlor hoses with shut-off valves. Inspect all hoses and valves daily. If a leak occurs, stop water flow by isolating the area of the leak and/or repair the leak within 72 hours.

BMP 2.2.2

If a semi-automatic floor flush system is used, it must be equipped with a timing device to limit the duration of cleaning and be designed to use no more water than necessary unless the water used is water recycled within the dairy operation.

The Annual Report required by A.R.S. § 45-632 shall include a description of the flush system that includes the flush schedule and the amount of water used for each flush. This information shall be submitted one time only (the first annual report following acceptance into the BMP Program) unless there is a change to the timing device.

APPENDIX 6B
DAIRY OPERATION BEST MANAGEMENT PRACTICES PROGRAM
STANDARD BEST MANAGEMENT PRACTICES

WATER USE CATEGORY 3. CORRAL DESIGN AND MAINTENANCE

Description: Proper corral design and maintenance will reduce water use in the cow wash pen prior to milking by reducing the amount of wash time necessary to clean the cow. Sloping and maintaining the corral in a dry condition keeps the cow in a cleaner condition.

BMP 3.1

Slope corrals to prevent standing water and to promote drainage to the wastewater system.

The Annual Report required by A.R.S. § 45-632 shall include a dairy facility map that shows the corral design and the direction of slope. This map shall be submitted one time only (the first annual report following acceptance into the BMP Program) unless there is a change to corral design.

BMP 3.2

Scrape, harrow or drag corrals to eliminate holes and maintain corrals in a dry condition.

The Annual Report required by A.R.S. § 45-632 shall include a description of corral maintenance for wet and dry conditions and a maintenance schedule. This information shall be submitted one time only (the first annual report following acceptance into the BMP Program) unless there is a change in corral maintenance.

WATER USE CATEGORY 4. CLEANING AND SANITIZING MILKING EQUIPMENT

Description: Cleaning and sanitizing milking equipment is necessary to provide a safe dairy product. Water is also used in pre-coolers and vacuum pumps during the milking operation. Water used for this purpose is usually between 5-10 percent of the total water use at the dairy operation. This water can be recycled for other uses at the dairy.

4.1 MILK COOLING AND VACUUM PUMP

BMP 4.1.1

If the milk cooling and vacuum pump system is water-cooled and is not a closed system, reuse water from the system to wash cow udders or pens, or for any other uses, consistent with state and federal sanitary codes.

The Annual Report required by A.R.S. § 45-632 shall include a description and diagram of how water is reused from the milk cooling and vacuum pump system. This information shall be submitted one time only (the first annual report following acceptance into the BMP Program) unless there is a change in how water is reused from the milk cooling and vacuum pump system.

APPENDIX 6B
DAIRY OPERATION BEST MANAGEMENT PRACTICES PROGRAM
STANDARD BEST MANAGEMENT PRACTICES

4.2 MILK LINE WASHING

BMP 4.2.1

Install and operate the milk line washing system with an automatic or semi-automatic timing device.

The Annual Report required by A.R.S. § 45-632 shall include a description of how the milk line washing system operates. The description shall include the number of cycles per washing and the amount of water used per washing. This information shall be submitted one time only (the first annual report following acceptance into the BMP Program) unless there is a change in the number of cycles per washing and the amount of water used per washing.

4.3 BACK-FLUSH SYSTEMS

BMP 4.3.1

Maintain and service all back-flush systems in accordance with the manufacturer's design specifications and maintenance schedule.

The Annual Report required by A.R.S. § 45-632 shall include the manufacturer's design specifications and a maintenance schedule. This information shall be submitted one time only (the first annual report following acceptance into the BMP Program) unless there is a change to the back flush system.

WATER USE CATEGORY 5. DUST CONTROL, CALF HOUSING CLEANING AND FEED APRON FLUSHING

Description: Control of dust, wastes and feed residues is necessary for fly control, sanitation and animal health. This requires water for cleaning and flushing feed aprons and calf housing and for wetting roadways. Conservation potential in this category includes recycling and reusing water, avoiding waste, and employing simple technologies that can reduce the amount of water needed for dust control.

BMP 5.1

If the dairy flushes the cow feed apron, design the systems to recycle water from the cow udder wash system or to pump wastewater and recycle it from the lagoon or wetland area.

The Annual Report required by A.R.S. § 45-632 shall include a description of how water is recycled at the operation, an estimate of the amount of water recycled, and the method of estimation. This information shall be submitted one time only (the first annual report following acceptance into the BMP Program) unless there is a change to how water is recycled.

APPENDIX 6B
DAIRY OPERATION BEST MANAGEMENT PRACTICES PROGRAM
STANDARD BEST MANAGEMENT PRACTICES

BMP 5.2

If the calf housing utilizes a flush system to remove animal wastes, design and manage the system so that it uses only the minimum amount necessary and equip with a timer to minimize the duration of each flush.

The Annual Report required by A.R.S. § 45-632 shall include a description of how the system is designed and managed to minimize water use, the length of time of each flush and the number of times per day on average that the system is in operation, and a water system map of the facility showing the location of the timer. This information shall be submitted one time only (the first annual report following acceptance into the BMP Program) unless there is a change to the design or operation of the flush system.

BMP 5.3

If dust control practices are used at the facility, the following dust control methods should be used: paving, aggregate, chemical binding agents or dairy wastewater if consistent with state and federal standards. If potable water is used for dust control it must be used as efficiently as possible.

The Annual Report required by A.R.S. § 45-632 shall include a description of the dust control technology(ies) used and the area on which dust control is practiced, and the amount of water used for dust control. If water use is estimated, provide a description of how water use is estimated. This information shall be submitted one time only (the first annual report following acceptance into the BMP Program) unless there is a change to dust control practices.

WATER USE CATEGORY 6. DAIRY ANIMAL COOLING

Description: Dairy animal cooling is an effective method to improve milk production per cow and reproductive efficiency, which are important factors in dairy profitability. Animal cooling is also an important factor in improving animal health. The amount of water required depends on the type of method or methods used to cool cows, on the maintenance practices for the system and on the hours of usage. Methods to conserve water for each cooling system are available to dairy farm management.

6.1 HOLDING PEN COOLING

BMP 6.1.1

Design and operate independent fan and spray systems to ensure that water is used efficiently under all weather conditions.

The Annual Report required by A.R.S. § 45-632 shall include a diagram demonstrating that fans and spray systems are used independently and provide information on how the system is managed depending on weather conditions. This information shall be submitted one time only (the first annual report following acceptance into the BMP Program) unless there is a change to the fan and spray systems.

APPENDIX 6B
DAIRY OPERATION BEST MANAGEMENT PRACTICES PROGRAM
STANDARD BEST MANAGEMENT PRACTICES

6.2 COW EXIT AND RETURN LANES COOLING

BMP 6.2.1

Use leaf gate, wand switch, electric eye or motion (proximity) indicators to automatically activate the water valve.

The Annual Report required by A.R.S. § 45-632 shall include a description of the activation device used at the dairy operation and how it operates, including the length of time the water valve is in operation and the amount of water used, and include the average number of times per day that the device is activated in a year. This information shall be submitted one time only (the first annual report following acceptance into the BMP Program) unless there is a change in activation device.

6.3 FEED LINE COOLING

BMP 6.3.1

Locate the feed line cooling system to take advantage of prevailing winds in order to place water directly on the dairy animal. Equip the system with timers to control the duration of use.

The Annual Report required by A.R.S. § 45-632 shall include a water system map of the dairy facility showing the location of all timers and the direction of prevailing winds. Report the length of time the timer is in operation and the average number of times per day that the system is in operation in a year. This information shall be submitted one time only (the first annual report following acceptance into the BMP Program) unless there is a change in the feed line cooling system or timers.

6.4. CORRAL SHADE COOLERS

BMP 6.4.1

Equip corral shade coolers with thermostats or timers to control operation time.

The Annual Report required by A.R.S. § 45-632 shall include a water system map of the dairy facility showing the location of all thermostats or timers and report the average daily length of time the coolers are in operation in a year. This information shall be submitted one time only (the first annual report following acceptance into the BMP Program) unless there is a change in the thermostats or timers.

BMP 6.4.2

Establish an inspection schedule to ensure regular maintenance of nozzles and water filter systems.

The Annual Report required by A.R.S. § 45-632 shall include an inspection and maintenance schedule. This schedule shall be submitted one time only (the first annual report following acceptance into the BMP Program) unless there is a change in the maintenance schedule.

APPENDIX 6B
DAIRY OPERATION BEST MANAGEMENT PRACTICES PROGRAM
STANDARD BEST MANAGEMENT PRACTICES

WATER USE CATEGORY 7. DAIRY ANIMAL FEED PREPARATION

Description: Water is used in the preparation of dairy animal feed at dairy operations to pre-soak cereal grain for processing, (rolling and flaking). A large use of water in feed preparation is its addition to the total mixed ration (TMR) to improve feed intake. The amount of water needed depends on the dryness of the feed in the ration. The total amount of water added to the feed could equal 20 percent of the ration. The greatest conservation potential for feed preparation rests with leak detection and prevention.

BMP 7.1

Install shut-off valves at each water source used for feed preparation to allow for the isolation of leaks. If a leak occurs, isolate the area of the leak and/or repair the leak within 72 hours.

The Annual Report required by A.R.S. § 45-632 shall include a water system map of the facility showing the location of all valves. This map shall be submitted one time only (the first annual report following acceptance into the BMP Program) unless there is a change in the location of the valves.

Bibliography

ADWR. (2011). *Demand and Supply Assessment, Pinal Active Management Area*. Phoenix: ADWR.